

**SURVEILLANCE KITS ON TEST**

**TIGHTEN UP YOUR HOME SECURITY - FROM UNDER £40**



# micro mart

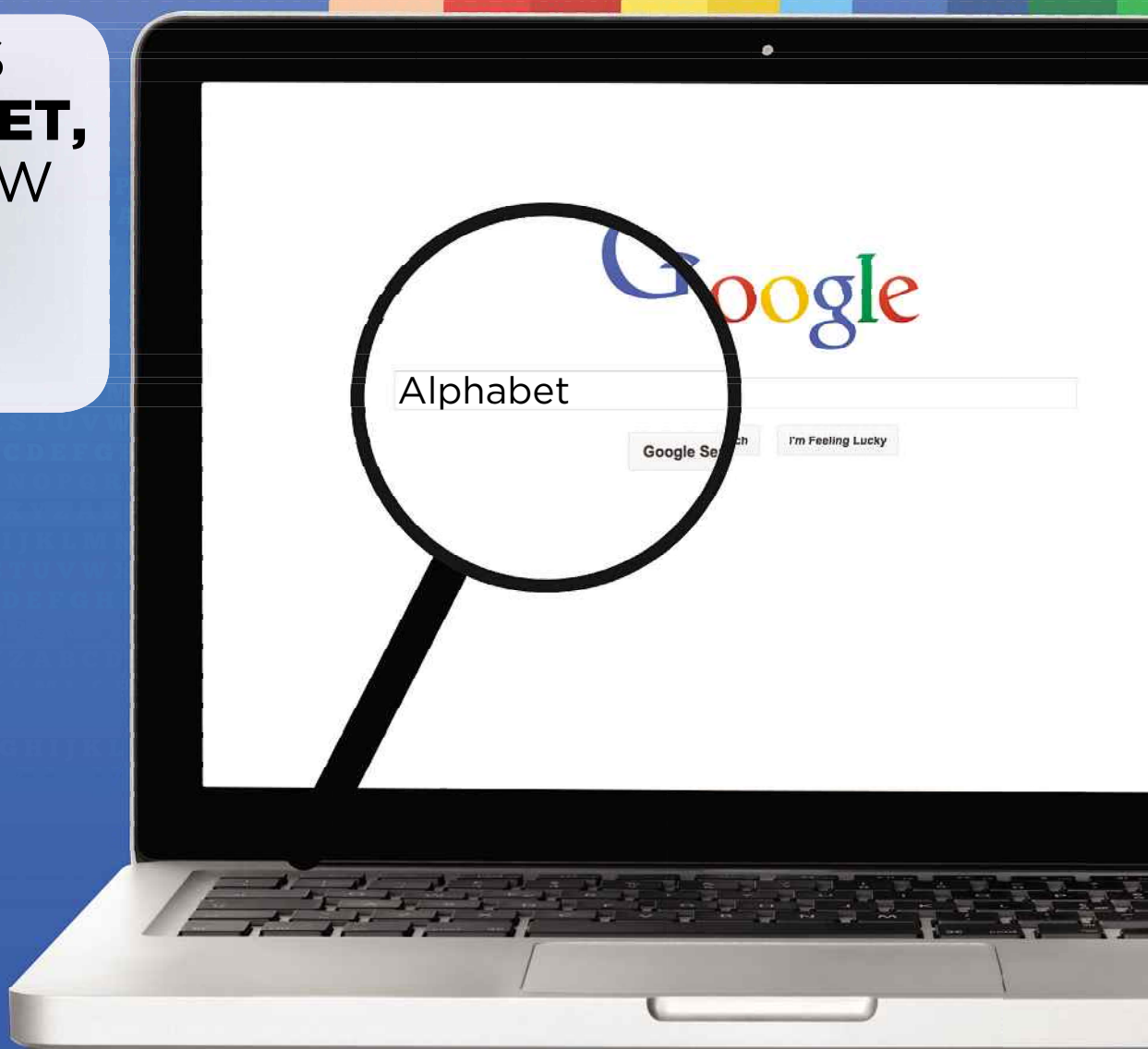
Computing in the know

## Plus

- Reap The Rewards Of A Multi-GPU Rig!
- Lenovo's Latest Bloatware Blight, And How To Cure It
- Will Machines Ever Rule Us All?

# GOOGLE'S BIGGEST EVER CHANGES

WHAT IS  
**ALPHABET**,  
AND HOW  
WILL IT  
AFFECT  
YOU?



27 AUGUST - 2 SEPT 2015 ISSUE 1377



9 771473 025081  
tinyurl.com/mm1377mm

£2.50





## Windows 10 now available on CCL PCs

Why choose CCL for your new PC?

FREE Next Day Delivery

FREE Help and Support

3 Year Warranty as Standard

**CCL Alpha Home PCs** offering the best value for all the family's everyday computing needs.



### CCL Alpha Tornado II PC

**£419**  
DELIVERED

Intel Core i3 3.7GHz, 4GB RAM  
1TB HDD, DVD, GT 720 Windows 10

Great home PC powered by the Intel Core i3 with 4GB of DDR3



### CCL Alpha Prime PC

**£279**  
DELIVERED

Intel Celeron 2.8GHz, 4GB RAM, Intel HD  
1TB HDD, DVD, WiFi, Windows 10

Amazing value PC ideal for home, home office work, movies, photos!



### CCL Alpha Supreme PC

**£299**  
DELIVERED

Intel Pentium 3.3GHz, 4GB RAM, Intel HD  
1TB HDD, DVD, WiFi, Windows 10

Our best selling home system! with Dual Core Processor and 1TB Storage

**CCL Elite Gaming PCs** specifically designed to get the most from today's popular games.

Experience our Mini Gaming PC



### CCL Nebula 300i ITX Gaming PC

**£699**  
DELIVERED

Intel Core i5 3.2GHz, 8GB RAM, 120GB SSD  
1TB HDD, GTX 960, WiFi, Windows 10

Huge specification in a small compact design including NVIDIA GTX 960

OVERCLOCK OPTIONS up to 4.5GHz



### CCL Elite Eagle IV Gaming PC

**£1179**  
DELIVERED

Intel Core i7 4GHz, 8GB RAM, 250GB SSD,  
2TB HDD, GTX 970, WiFi, Windows 10

With a top of the range Intel Core i7 processor and NVIDIA GeForce GTX 970

With GTX 970 Graphics Card



### CCL Elite Vulture V Gaming PC

**£1379**  
DELIVERED

Intel Core i7 4GHz, 8GB RAM, 500GB SSD,  
3TB HDD, GTX 970, WiFi, Windows 10

With a top of the range Intel Core i7 CPU NVIDIA GeForce GTX 970 & 500GB SSD

Customise your new PC and make it your own, with our PC customiser  
plus view many more great PC offers at [www.cclonline.com](http://www.cclonline.com)

call: **08000 50 10 10**

visit: [www.cclonline.com/pc](http://www.cclonline.com/pc) email: [pcsales@cclonline.com](mailto:pcsales@cclonline.com)

find us: CCL Computers Ltd, Inmoor Road  
Off Cross Lane, Bradford, BD11 2PS

Prices correct at time of going to publishing  
(6th August 2015). Images & designs  
are for illustrative purposes only. Monitors and desktop  
bundles are available separately. Please call for details.





# LET YOUR IMAGINATION BE THE LIMIT NOT YOUR PC

Just starting out? CCL have the ideal beginner PCs optimised specifically for Minecraft.

Great Entry  
Level PC



## CCL Elite Iron Crafter PC

**£299**  
DELIVERED

Just beginning? The Crafter Iron will be with you all the way as you start your journey into the world of Minecraft.

AMD A8-7650K 3.3GHz, 4GB RAM, 1TB HDD  
Radeon R7 Graphics, DVD, WiFi, Windows 8.1

Double RAM  
and increased CPU



## CCL Elite Gold Crafter PC

**£349**  
DELIVERED

Take control and change the world of Minecraft how you see fit with the Crafter Gold, powerful enough to handle mods.

AMD A10-7870K 3.9GHz, 8GB RAM, 1TB HDD,  
Radeon R7 Graphics, DVD, WiFi, Windows 8.1

Want to take your crafting skills to the next level? Our advanced Minecraft PCs are capable of streaming your game via the internet and offline video editing

Ideal for  
Game Streaming



## CCL Elite Diamond Crafter PC

**£449**  
DELIVERED

Your chance to shine online - the Crafter Diamond has the graphical strength you need to play and stream the game at the same time.

Intel Core i3 4170 3.7GHz, 8GB RAM, 2TB HDD  
GTX 750 Graphics, DVD, WiFi, Windows 8.1

Create & Edit  
Video for YouTube



## CCL Elite Emerald Crafter PC

**£649**  
DELIVERED

Work hard and you too could become a YouTube star using the Crafter Emerald, with power to record and edit your Minecraft videos.

Intel Core i5 4460 3.2GHz, 16GB RAM, 120GB SSD  
2TB HDD, GTX 960 Graphics, DVD, WiFi, Windows 8.1

email: **pcsales@cclonline.com**

visit: **www.cclonline.com/pc** call: **08000 50 10 10**

find us: CCL Computers Ltd, Inmoor Road  
Off Cross Lane, Bradford, BD11 2PS

Prices correct at time of going to publishing  
(3rd Aug 2015). Images & designs  
are for illustrative purposes only. Monitors and desktop  
bundles are available separately. Please call for details.



# Contents

This week...

## 08 Google Inc. Becomes Alphabet

...also take "smaller bets in areas that might seem very compared to our current businesses." From the more, and to do important and meaningful things

d crazy at the time. Many of those crazy things Google Maps, YouTube, Chrome, and Android. e are still trying to do things other people think d about.

e companies tend to get comfortable doing the atal changes. But in the technology industry, he next big growth areas, you need to be a bit

day, but we at a new company, called Alphabet. I am abet as CEO with help from my capable partner.

## 08 Google Inc. Becomes Alphabet

While many had been expecting an evolution of Google's company structure, the announcement that it would be radically altering the way it manages its ever-increasing number of interests, by forming a parent company called Alphabet, took virtually everyone by surprise. So what does the restructure mean for its users, employees and investors? David Briddock takes a look

## 18 Multi-GPU Rigs

There are a whole host of benefits to running multiple graphics cards in your PC, especially if you're a gamer or interested in working with video. The technology and techniques can be confusing, though, which is why we've been looking at the how, the why and what you should buy

## 24 Productivity Apps

Can an app really make your day more productive? Rob Leane got his hands on a few to see if it was possible to cure a case of chronic procrastinitus with a smartphone.

## 47 Surveillance Systems Group Test

Network connected camera systems are no longer the preserve of commercial premises and the homes of the rich and famous. As the technology has become more established, prices have fallen to the point where they're now a practical option for many of us? Here we look at a range of systems and pick the one we recommend you keep an eye on



## 18 Multi-GPU Rigs



## 24 Productivity Apps



# 47 Surveillance Systems

# 56 The Rise Of The Machines

## 56 Rise Of The Machines?

The 'machines take over/destroy humanity' trope is a well established one in the world of sci-fi but, as we crawl towards the goal of creating artificial intelligence, could it ever become reality? Rob Leane takes a good look over his shoulder as he tries to work it out

## 60 Lenovo's LSE Problem

For the second time in six months Lenovo has made the tech headlines for a similar faux pas. First it was for installing the much-maligned, malware-like Superfish software on its systems, and now it's been caught at it again after problems with its 'Bootkit' Lenovo Service Engine (LSE) were highlighted. So, what is LSE, do you have it and how do you get rid of it?

## 64 Is Anyone Still Using Second Life?

As the tech industry recovered from the bursting of the first dotcom bubble, Second Life became almost synonymous with the brave new worlds online social communities could become, and then – frankly – how disappointing the reality of it was. So, having once been the focus of a large amount of press and public attention, what is Second Life like now, and is it worth you taking another look? Sarah Dobbs goes exploring

## Also In This Issue...

### 17 Product Showcase

Four exciting new technology products for you to peruse

### 30 Remembering

Remember the Amstrad Sinclair PC200? No, neither did we until David Hayward reminded us...

### 31 Component Watch

Want some DDR4 RAM to go with new Skylake processor? Of course you do!

### 62 Using App Inventor

Build an Android App with Google's toolkit

### 86 Crowdfunding Corner

We've got two games vying for your monetary support this week

### 87 App Of The Week

There plenty of media streaming apps, so what's BubbleUPnP got over them?

## Group Test Surveillance Kits

- 47 iON The Home
- 48 Swann DVR4-1500 DVR 4 Channel Kit (2-Cam)
- 49 TRENDnet 4-Channel HD PoE NVR Kit
- 50 Belkin NetCam HD WiFi with Night Vision
- 51 Fusion Curve IP Cam
- 52 Nest Cam
- 53 Sum-up

## Reviews

- 38 Gigabyte P37X Gaming Laptop
- 39 Logitech BCC950 Conference Cam
- 40 Vodafone Smart Ultra 6
- 42 DS-920DW
- 43 Xenta Laser Wireless Mouse
- 44 Cast Of The Seven Godsend's
- 45 Onikira: Demon Killer
- 46 EVGA GeForce GTX950 FTW 2GB

## Experts

- 82 Ask Aaron
- 84 Ask Jason

## Specialists

- 68 Linux Mart
- 69 Amiga Mart
- 70 Mobile Mart
- 71 Hardware Mart
- 72 Gaming Mart

## News

- 32 The Latest News

## Regulars

- 54 Subscriptions
- 74 Ad Index
- 76 IT Essentials
- 78 Classifieds
- 88 Logging Off



### SAVE A BUNDLE

Subscribe to Micro Mart today and save 24% on the shop price.

**Call 0844 844 0082**

Basic annual rate

UK: £77.50

Europe: £185

Rest of World: £340

Online subscriber service

Change your address and renew your subscription at

[www.subsinfo.co.uk](http://www.subsinfo.co.uk)

Email:

[micromart@servicehelpline.co.uk](mailto:micromart@servicehelpline.co.uk)



# SUPERB MORGAN BARGAINS • WITH EXTRA 10% DISCOUNT! MASSIVE COMPUTING SALE! WITH AN EXTRA 10% DISCOUNT

Get an extra 10% OFF your new sale item or almost anything on our site!

Just visit our website today [www.morgancomputers.co.uk](http://www.morgancomputers.co.uk)

Enter the promotional code **MMTEN** at the checkout online and see your prices reduce by an extra 10%! OR call **FREEPHONE 0800 008 7451** and we'll do the work for you!

Like the iPhone 5! with a bigger screen, better battery, Dual SIM card support and now ... **UNDER £90!**

On par with recent Samsung Galaxy and Apple iPhone models at a fraction of the price. This superb new Quad Core handset will NOT disappoint. Just see what you get! ...



Part Code: 41995

**£86.36**

NOW ONLY

**BRAND NEW!**  
STOREX QC-55

**QUAD CORE! POWER!**



## HP 8000 ELITE SPECIAL!

Now with an incredible 8GB DDR3 RAM, a Massive 1TB HDD, Wi-Fi and a 1GB Graphics card the reliable and powerful 3.0GHz Core2Duo Intel processor will make short work of most tasks!

- Intel Core 2 Duo E8400/3 GHz (Dual-Core)
- 3.0 Ghz • 8GB RAM (installed)/16 GB (max)
- 1TB - SATA • DVD/CD • Stereo Sound
- Network: Wi-Fi & Gigabit LAN • Asus G210 Graphics
- Ultra Small: 33.8 cm x 37.9 cm x 10 cm
- Windows 7 Professional Operating System

**TOP SPEC! LOW PRICE!**



**£224.96** NOW ONLY

Part Code: 41820



## SUPER FAST TOP SPEC LAPTOP WITH 8GB RAM AND 1TB HDD



**QUAD CORE!**



**15.6" 8GB 1Tb Touchscreen Business or Personal All Round Performer!**

Perfect for work or play! This 15.6" high end laptop has bags of RAM and Storage with a superb QUAD CORE AMD processor and touch screen all for under £330! Don't miss your opportunity to grab one while we still have a few.

- Quad Core AMD 2.0GHz Processor
- 15.6" HD Touchscreen Display
- 8Gb RAM
- 1Tb Hard Disk
- DVD RW Optical Drive
- Wi-Fi, Bluetooth
- Webcam
- Only 2.3Kg

**MAJOR PRICE REDUCTION!**

Part Code: 41987

**£296.96** NOW ONLY

## HP PAVILION 500-326NA POWER TOWER



**Powerful Quad Core computing and impressive dedicated graphics**

With convenient expandability options, the HP Pavilion 500 is the versatile PC that will grow as your needs do. With its clean modern style, it'll fit seamlessly anywhere you put it. With fast processors, strong graphics, and more storage, you've found your ideal PC

- AMD Quad Core 3.5 GHz Processor • 8Gb RAM
- 1TB 7200RPM HDD • AMD Radeon R7 240 dual graphics
- DVD/RW • Wi-Fi • Ethernet • Windows 8.1



**£224.96** NOW ONLY

**NEW LOW PRICE!**

Part Code: 489229

## 20" ALL-IN-ONE DUAL CORE HP PC!

This Dual core 20" All-In-One HP PC boasts stylish minimalist looks and great performance levels! The Dual core Intel processor makes day to day computing a breeze, the onboard HD Radeon graphics and Hi resolution 20" screen produce crisp sharp images.



- 41992 processor • 4Gb RAM
- 20" 1600 x 900 (pixels) Hi-Res Ultra Bright HD Screen
- 500Gb HD • Super Multi DVD
- Wi-Fi • Ethernet
- 4 USB Ports
- Windows 7 professional OS
- Includes keyboard & mouse

Part Code: 41992

**£152.56** NOW ONLY

**PRICES INCLUDE**

## AN EXTRA 10% DISCOUNT

PRICES SHOWN INCLUDES An EXTRA 10% DISCOUNT Buy any of these products and claim a special MicroMart readers ONLY extra 10% discount!

Go to our website and place your order for any of these superb offers. Enter your special promo code **MMTEN** at the checkout online to enjoy these specially reduced deals

**All Prices include VAT**  
Monday to Friday  
8.30AM TO 6.00PM

# MorganComputers

follow us on **twitter**

Like us on **Facebook**

E&EO. All trademarks are acknowledged. Prices are subject to change without notice. Our terms and conditions of trading apply. Copies are available on request.



**SUPERB MORGAN BARGAINS • WITH EXTRA 10% DISCOUNT!**

## HP ELITEBOOK 8560W i7 QUAD CORE LAPTOP

### A True Pro Power Laptop!



**O**riginally priced in the thousands this laptop was built for no holds barred performance and designed for people that wanted a real desktop replacement. Its price was the biggest thing holding people back! But now at less than £345 you can grab a high spec top performance laptop at a bargain price! The features and spec are superb, the quality is 1st class.

- Intel Core i7 Quad Core 2.3GHz Processor ● 8 Gb RAM
- 320GB 7200rpm HDD ● DVD/RW Multi Drive
- 15.6" 1920 x 1080 HD screen ● Wi-Fi ● Bluetooth ● Ethernet
- 2GB Nvidia Quadro 3D Graphics Card ● Webcam
- MMC Card Reader ● Windows 7 pro OS

**QUAD  
CORE i7  
POWER!**

Part Code:  
4250



**NOW AT OUR  
LOWEST PRICE EVER  
WITH AN EXTRA  
10% DISCOUNT**

**£341.96 NOW ONLY**

## NEPTUNE PINE 16GB UNLOCKED SMART WATCH

### THE FIRST STAND ALONE, FULL FEATURED SMARTWATCH. MAKE CALLS, TEXT, SURF THE WEB AND MORE, ON THE ANDROID PLATFORM

Use on any  
of these  
networks



.. and  
many  
more!

**A** truly unique Mobile device! It's one of the largest SMART watches we have encountered meaning you can actually use the touch screen properly. The on screen keyboard can be used by grown up fingers! Throw in GPS, Cameras, Wi-Fi, Bluetooth and a world of customisation for the more advanced user and this really is a BARGAIN!

- 2.4" TFT ● 512Mb RAM ● 16/32Gb Storage ● Wi-Fi ● Bluetooth
- GPS ● VGA Front Camera ● 5Mp Rear Camera ● Micro SIM ● USB 2



**SPECIAL NEW PRICE WITH AN EXTRA 10% DISCOUNT**

16Gb Version Part Code: 42325

32Gb Version Part Code: 42326

**£53.96 NOW ONLY**

**£80.96 NOW ONLY**



**www.morgancomputers.co.uk**

**Or Call FREEPHONE 0800 008 7451**



**GET A COPY OF  
OUR CATALOGUE!**

Scan this QR code to go online,  
order your free catalogue and  
we will rush you our latest  
greatest offers by post

**PRICES SHOWN INCLUDES AN EXTRA 10% DISCOUNT** Buy any of these  
products and claim a special MicroMart readers only extra 10% discount!  
Go to our website and place your order for any of these superb offers at our standard discount price.  
Enter your special promo code **MMTEN** at the checkout online to enjoy these specially reduced deals!



# Does Alphabet Spell A New Dawn?





## Google is reorganising itself as Alphabet, but why? How will it work, and what difference will it make to us? David Crookes looks at what comes next

In 2001, the Royal Mail made a risky decision that would prove to be a short-lived disaster. In a bid to show that it did more than just deliver the post, the company ditched a well-recognised name, which perfectly described what the firm ultimately did, and rebranded as 'Consignia', a name that the bosses admitted did not mean anything. After much eyebrow raising, and a refusal by many workers to comply, the firm changed to the more reasonable Royal Mail Group. Consignia barely lasted a year, and ultimately went down as one of the biggest – and most expensive – corporate mistakes of all time.

The Royal Mail has not been the only company to rip up tradition and recognisability in favour of reinvention, though. Coke became New Coke for a spell, and the taste went down like a lead balloon, while Play.com became Rakuten and stripped itself of any connotations about what the company sells in the process. Indeed, removing reference to the core of a business is popular: Logitech is now just Logi, Kentucky Fried Chicken is KFC. The Sci-Fi Channel has abstracted to become Syfy, and Pizza Hut wanted to switch to The Hut, before wisely reconsidering the decision.

So what should we make of the most recent move by Google? After 16 years of building the most recognisable web brand on the planet, the company is going to be renamed Alphabet and it is set to be majorly restructured. These changes seem to indicate the intention to move away from being known as simply a company that is about search, towards being an organisation that is widely perceived to have its fingers in a multitude of pies.

Co-founder Larry Page and Sergey Brin say they want to make the company "cleaner and more accountable" and they profess to being excited about what opportunities the changes may bring up. What does it actually mean for the company and consumers, though? Is Google about to do a Consignia?

The simple answer to that last question – at least for now – is 'no': the name Google is not actually going anywhere near the trashcan. It will continue to be a much-loved and well-used brand, and any talk of people suddenly ceasing to "google" the internet in favour of "alphabeting" their queries is premature. Google will remain the name of Alphabet's search engine. We will still have the likes of Google Maps, Google Mail, Google Chrome, Google Drive too. There will be a Google

business that will also incorporate Android and Google Play and it will be headed up by Sundar Pichai who will become the new CEO of Google.

It is Google Inc. – the name of the firm comprised of a large portfolio of divisions – that is being replaced. Alphabet will instead become the name of the holding company that controls a range of sub-businesses. Why? Well, the name Google Inc. immediately brings to mind the consumer products that have created the foundations on which the company was built. That, quite simply, does not suit the various other directions the firm wants to go in.

In this sense, unlike some of the other rebranding exercises that have affected companies over the years, Google's switch to Alphabet is not as radical as it first appears. Page and Brin are canny people, and would have realised the folly in killing off a name that has quickly become an eponym. What Alphabet will do is allow the company to stretch itself even more without causing confusion over what the company as a whole is actually all about.

Google will be separated from the other parts of the company and become one of numerous, independent and separate businesses under the Alphabet umbrella. Others like Fiber, Life Sciences, Nest and X Lab will also form their own companies. Each of them will have its own CEO, who will potentially be allowed to take their own risks and develop firms in their own ways. Overseeing all of this will be Page and Brin in their roles as, respectively, the CEO and president of Alphabet.

Page says each of the businesses will report its own financial results; meaning Google, as Alphabet, will be more transparent. It is also hope the changes will allow it to react more swiftly to a changing technological landscape and allow it to be ever-more influential.



▲ Larry Page and Sergey Brin will be the CEO and president of Alphabet

**ECLIPSE**  
COMPUTERS

www.eclipse-computers.com

08444 723 723

106 St Nicholas Street, Coventry. CV1 4BT  
Mon-Fri 9:30am-6:00pm, Sat 9:30am-3:30pm

**The Home Of  
Award Winning  
Computer Systems**

### Home & Office PCs



Bring your digital world to life with these Great value systems ideal for Home, Office or Students.

From **£199.95**

### Custom Gaming PCs



Less Work... More Play... Immerse yourself in the world of Games and achieve mega tasking with ease.

From **£349.95**

### Xtreme Gaming PCs



Amazing performance and stunning visuals with a boost. Raise the bar and Rule Your Game.

From **£999.95**

### Media Centre PCs



Bring the PC & digital life to the Big Screen in your living, all from the comfort of your sofa.

From **£299.95**

**You Spec It...  
We Build It...**

Over 240,000 Systems  
Configured Online  
& Counting...

www.eclipse-computers.com





## is for Google

As Sergey and I wrote in the original founders letter 11 years ago, "Google is not a conventional company. We do not intend to become one." As part of that, we also said that you could expect us to make "smaller bets in areas that might seem very speculative or even strange when compared to our current businesses." From the start, we've always strived to do more, and to do important and meaningful things with the resources we have.

We did a lot of things that seemed crazy at the time. Many of those crazy things now have over a billion users, like Google Maps, YouTube, Chrome, and Android. And we haven't stopped there. We are still trying to do things other people think are crazy but we are super excited about.

We've long believed that over time companies tend to get comfortable doing the same thing, just making incremental changes. But in the technology industry, where revolutionary ideas drive the next big growth areas, you need to be a bit uncomfortable to stay relevant.

Our company is operating well today, but we think we can make it cleaner and more accountable. So we are creating a new company, called Alphabet. I am really excited to be running Alphabet as CEO with help from my capable partner.



▲ Alphabet used the domain name *abc.xyz* to display this statement... Presumably more information will follow

### The Rise Of Pichai

Google's restructuring has been coming for some time, even if the name change was unexpected (that said, a year ago Reddit poster Ojus Naravene listed all of the various brands Google owns and placed each one next to a letter of the alphabet, but that was most likely coincidence). *Business Insider* claims Google has been considering this kind of restructure for four years, but certainly last October we saw signs that Google was seeking to shake things up a bit.

“Google's restructuring has been coming for some time, even if the name change was unexpected”

At the time, CEO Larry Page sent out a memo that explained how he was going to transfer leadership of the core Google products to Sundar Pichai, who was then the head of Chrome, Android and Google Apps. He said Pichai was also going to be responsible for maps, search, Google+, commerce and ad products, research and infrastructure. Crucially, six executives – including those responsible for search, social media and research – who had all previously reported to Page, would now be directly under Pichai. It was a sign that Page and Brin were letting go of the established Google business areas, and it pointed to a major change in the thinking.

### What's In A Name?

Alphabet is an unusual name, and even Larry Page admits it will take some getting used to. It has also led to speculation that the company will seek to eventually create 26 companies identifiable by each letter just as Android ties food into each letter of the alphabet for its various releases (the latest is M for marshmallow).

While Alphabet may well seek to go down that path at some point, Page says the company chose Alphabet because it “means a collection of letters that represent language, one of humanity's most important innovations”. He also says it allows Alphabet to refer to its Google roots, something it appears the company does not want to lose sight of, explaining the alphabet as “the core of how we index with Google search”.

If that's not enough, Page adds (perhaps over-thinking things): “We also like that it means alpha-bet [Alpha is investment return above benchmark], which we strive for!” At least there's an idea (or three) behind the name.

And, just in case you were wondering, Google is a play on “googol” which is a mathematical term for the numeral 1 followed by 100 zeroes, which is said to reflect Page and Brin's mission to organise an infinite amount of information on the web.

This was a major promotion for Pichai and it effectively made him the boss of Google's products, answering only to Page. That put him a very powerful position, one which has only become stronger now that he is CEO of Google. The past few months can therefore be seen as some sort of extended test that he has





# AWARD WINNING COMPUTER SPECIALISTS DESIGN YOUR OWN DREAM GAMING PC ONLINE TODAY

www.falconcomputers.co.uk - Tel: 0191 5676669



## WARRIOR 5GTX

The Falcon Warrior 5GTX is packed Full Of Advanced Features including...

Case: Cooler Master N400 Gaming case  
Board: Gigabyte Intel Z97 Mainboard  
CPU: Intel i5 4460k 3.2hz Quad Core  
RAM: 8GB DDR3 1600 Gaming Memory  
GFX: Nvidia GTX 970  
HDD: 2TB Seagate 7200RPM - 64Mb  
OPTICAL: 24x Samsung DVDRW  
PSU: 500w PSU Bronze 80+  
OS: Microsoft Windows 10 64Bit  
Warranty: 2 Year Parts 3 Year Labour

\*AOC IPS 1080P Monitor Is An Optional Extra  
Quick Find Code: ELITE 5GTX

FALCON RECOMMENDS  
AOC IPS DISPLAYS



NVIDIA  
GEFORCE  
GTX



FROM ONLY

# £799.99

INCLUDING VAT

WWW.FALCONCOMPUTERS.CO.UK



### Falcon Galaxy Value Gaming PC

AMD 6600K Quad Core 3.9Ghz  
Gigabyte A55 Mainboard  
8GB DDR3 1600 Memory  
Corsair Spec 01 Case  
24x DVDRW (Samsung)  
1TB 7200RPM HDD  
AMD R7 APU Graphics (Upgradable)  
500W Bronze 80+ PSU  
Microsoft Windows 10 64 Bit  
Quick Find Code: V-PC3

## £399.99



### Falcon Phantom Elite Gaming PC

Intel i5-4690K 3.50Ghz Devils Canyon  
Gigabyte Z97-DS3H Mainboard  
8GB DDR3 1600 Memory  
NZXT 410 White Gaming Case  
1TB 7200RPM HDD  
24x DVDRW (Samsung)  
2Gb AMD Radeon R9 285  
600W FSP 80+ PSU  
Microsoft Windows 10 64 Bit  
Quick Find Code: ELITE-BR7

## £759.99



### Falcon G8 Raider Elite Gaming PC

Intel i5-4690K 3.50Ghz Devils Canyon  
Gigabyte Z97-DS3H Mainboard  
8GB DDR3 1600 Memory  
Aerocool Dead Silence Gaming Case  
120GB SSD + 1TB 7200RPM HDD  
24x DVDRW (Samsung)  
2GB Nvidia GTX 970  
500W 80+ PSU  
Microsoft Windows 10 64 Bit  
Quick Find Code: G8 RAIDERS

## £899.99



### Falcon Maximus Gaming PC

Intel i5-4690K 3.50Ghz Devils Canyon  
ASUS Maximus II Ranger Z97 Mainboard  
16GB DDR3 2400 Kingston memory  
Thermaltake Core V51 Gaming Case  
240GB SSD + 2TB 7200RPM HDD  
24x DVDRW (Samsung)  
ASUS Nvidia GTX 970 Strix Edition  
600W Thermaltake PSU  
Microsoft Windows 10 64 Bit  
Quick Find Code: MAXIMUS

## £1169.99



CUSTOMISE YOUR DREAM PC TODAY

WWW.FALCONCOMPUTERS.CO.UK

190-206 Roker Avenue, Sunderland, SR6 0BN

All prices correct at time of printing but may change without prior notice.  
All terms and promotions are subject to availability. All images are for illustrative purposes only. All trademarks are property of their respective Owners.  
Falcon Computers 2 Year Warranty covers PC Hardware on selected PCs.  
See Website for More details.



GIGABYTE  
TECHNOLOGY





# Performance without compromise



## Rutilus

- AMD Athlon X4 860K
- ASUS® A88XM-PLUS
- 8GB HyperX FURY RAM
- AMD Radeon R9 270X
- 120GB Samsung EVO 850 SSD
- 1TB Hard Drive
- **Windows 8.1**
- 3 Year Standard Warranty

THIS SPEC FROM **£549\***



## Vanquish HAF III

- Intel® Core™ i5-4590
- ASUS® H81-Gamer
- 8GB HyperX FURY RAM
- 2GB NVIDIA® GeForce® GTX 960
- 120GB Kingston SSD
- 1TB Hard Drive
- **Windows 8.1**
- 3 Year Standard Warranty

THIS SPEC FROM **£749\***



## Minerva

- Intel® Core™ i5-4690K
- ASUS® RoG MAXIMUS VII RANGER
- 16GB HyperX FURY RAM
- 4GB NVIDIA® GeForce® GTX 970
- 120GB Kingston HyperX 3K SSD
- 2TB Hard Drive
- **Windows 8.1**
- 3 Years Warranty

THIS SPEC FROM **£999\***



## Ultimate Ti

- Intel® Core™ i7-5930K
- ASUS® Rampage V Extreme
- 32GB HyperX PREDATOR RAM
- 6GB NVIDIA® GeForce™ GTX980Ti
- 6GB NVIDIA® GeForce™ GTX980Ti
- 240GB HyperX SAVAGE SSD
- 1TB Western Digital Black Hard Drive
- **Windows 8.1**
- 3 Years Warranty

THIS SPEC FROM **£2,999\***



## Optimus Nebula

- Intel® Core™ i7-4720HQ
- 15.6" Matte Full HD IPS Display
- 8GB HyperX IMPACT RAM
- 2GB NVIDIA® GeForce® GTX 960M
- 120GB HyperX 3K SSD
- 1TB Hard Drive
- **Windows 8.1**
- 3 Year Standard Warranty

THIS SPEC FROM **£849\***



## Defiance 17

- Intel® Core™ i7-4720HQ
- 17.3" Matte Full HD LED Screen
- 16GB HyperX IMPACT RAM
- 4GB NVIDIA® GeForce® GTX 980M
- 240GB Kingston SSD
- 1TB Hard Drive
- **Windows 8.1**
- 3 Year Standard Warranty

THIS SPEC FROM **£1,349\***

Order your system now with PC Specialist







Award winning custom PC & Laptop manufacturer

Get a PC that's more **you**



- Overclocked Intel® Core™ i7-4790K
- ASUS® Maximus VII Ranger
- 16GB HyperX FURY RAM
- 4GB NVIDIA® GeForce® GTX 980
- 500GB Samsung EVO 850 SSD
- 2TB Hard Drive
- Windows 8.1
- 3 Year Standard Warranty

THIS SPEC  
FROM

£1,499\*

Quality builds at a low price  
**Always**

GET A FURTHER £15 OFF WITH THIS EXCLUSIVE VOUCHER CODE:

**MM49T**

ORDER ONLINE NOW

0333 011 7000

[www.pcspecialist.co.uk](http://www.pcspecialist.co.uk)



passed with flying colours. Having demonstrated that he could ably assume the reigns once tightly held by Page, it is he who everyone will now turn to in order to see the future direction of the Google suite of consumer products. It is a lot of power to have gained in a relatively short time.

At the same time, this will have a profound impact on Page's involvement. Last year, *Micro Mart* believed Pichai's rise was also going to give Page the opportunity to freshen up his own work within Google Inc. Having stated that he would concentrate on NEST, Calico, Google X, corporate development and the legal, financial and business side of the company, it was clear that Page was finding it more interesting and motivational to focus on the future and on areas of innovation.

The change was needed, then, but it was still surprising; Page is a self-confessed control freak who has always wanted to have a final say in everything that Google is doing. Indeed, *Business Insider's* 'Larry Page: The Untold Story' article claims he detests management layers, believing them to be an impediment. Yet with the restructure, he has just installed a whole new set of management layers beneath him.

## “ The CEOs will look to make their mark on their companies and the world ”

It would seem that he and Brin have found that, if they can trust Pichai, they can also trust others to oversee other parts of the company. It is also likely that Page and Brin have come round to thinking that the new way of working is not only viable but necessary. Google Inc. – now Alphabet – was simply becoming too diverse for any kind of tight control to be viable. Instead, Page's role will be one of the overseer. Pichai and the other CEOs will report directly to him and it will mean he can have a greater overview and get as involved or as hands on in the different businesses as is needed.

### ABC Of Alphabet

So what companies will Alphabet be split into? We've already very briefly mentioned some – Fiber, Life Sciences, Nest and X Lab – but a closer look at what these divisions do reveals just how diverse Google Inc./Alphabet has become. Life Sciences, for example, is working on health and biotech projects; among them, a contact lens which monitors the wearer's tears and measures the glucose level within them. It is working on this with the pharmaceutical giant Novartis and it is aimed at monitoring people with diabetes.

Another division, Calico Labs, is seeking to tackle ageing. Hundreds of millions of pounds are being pumped into this research and development biotech company and it couldn't be further removed from what people imagine Google to be. With a focus on research rather than search, Calico has been studying molecular biology, genetics, medicine and drug development for the past two years in a bid to help people live longer, healthier lives. Calico has top scientists on board and it is



### ABC Is Easy As XYZ

*The Daily Mail* – the newspaper that does no wrong and is never, ever branded *The Daily Fail*, of course – decided that Google had made a whopping error during its rebrand by failing to do the most basic of checks to see if “alphabet” was already taken as a domain name. As it turns out, BMW owns **alphabet.com** and uses it for the running of its fleet services company, a fact which the newspaper reported with some glee, filling up a bit of online space to tell everyone about it.

It also stated that the Twitter handle @alphabet has also been taken by a chap called Chris Andrikanich, who was rather bemused by the number of extra followers this little quirk of fate managed to gain him.

Was this really remiss of Google Inc.? Of course not. Alphabet would not have formed without some research, and to suggest otherwise is plain daft.

Rather than be put off by BMW's use of the domain name, it went for an altogether more creative and memorable address: **abc.xyz**. This eschews the use of .com, the gold standard generic top-level domain (gTLD) and, as you'd expect, it has led to a rush of people and organisations to attempt snapping up their own .xyz domains, which is now being seen as cutting edge and cool. It can cost \$185,000 to grab one though, and that has made Daniel Negari who owns the .xyz gTLD a very happy man. “Obviously, Google believes in it if they're rebranding on .xyz,” he said. “This is the ultimate validation.”

Incidentally, the announcement on **abc.xyz** contains a little Easter Egg pointing to another .xyz domain. By clicking the full stop in the middle of the seventh paragraph, visitors can view the website of **hooli.xyz**: the name of the fictional company featured in the HBO comedy *Silicon Valley*, which can be watched on Sky Atlantic in the UK.



expected to be a key part of the overall company. With that company being Alphabet it appears makes it easier to include Calico under the umbrella while, as part of Google, the vast difference to the perceived core product could cause confusion. The hope appears to be that such companies can flourish and grow as businesses, away from any such preconceptions.

What it also means is that other sub-businesses within Alphabet such as the investment arms Ventures and Capital will









Hangouts has been given its own website, which is one less reason to bother with Google+ and it could well spell the end of a service that has never really been adopted. In the medium term, though, the Google suite of products will evolve, with some dropping away.

Pichai has enough experience of what the division is about and what needs to alter. According to the filing for Alphabet, Google's business will definitely include search, ads, maps, apps and Android as well as the related technical infrastructure, which it calls the "Google business". Search and adverts will still be the breadwinner, and the money that flows from them may well be invested in the other businesses that are created – otherwise they may well sink under mountains of debt. Pichai may well be tasked with making his product range more lucrative, and looking for new ways of monetising them. He will also have a bigger influence than before: with YouTube coming directly under Pichai (the YouTube CEO Susan Wojcicki will now report to Pichai rather than Page), it would appear the video service is seen as part of Google's core business.

By not having the moonshot companies closely affiliated with the money-making ones, though, the Google products will be seen as ideal for investors. The more money pumped into Pichai's company, the greater the incentive to continue taking the battle to Microsoft and Apple in order to stay ahead of the game. Innovation as a whole is where we will eventually see a difference emerging, though.

**“ Page and Brin can make quicker decisions and make some new bets. So can the CEOs beneath them ”**

Each of the CEOs will look to make their mark on their companies and the wider world. Since some of those companies won't make money because they are moonshot-based, the impact they have will become a measurement. Those who work within them will also strive to work even harder and more creatively because there will be a greater chance to impress and thus to take lucrative and important positions. There are more CEO positions and extra management structures mean promotions will be easier to come by than before. Google will be able to attract the best talent as a result.

It will also see Alphabet follow in the footsteps of other companies. More and more big internet concerns have been diversifying away from their core and reconsidering what and who they are. Amazon is not just a seller of books, but of technology and entertainment services. Facebook is reaching into virtual reality. Apple is as much a music company as it is a maker of computers and phones. They are avoiding the problems of the past when the major tech firms would stick to their traditional core business and fall behind. By breaking up Google with an Alphabet rebrand and numerous smaller businesses within it (albeit smaller businesses that are still large),

### Who Is Sundar Pichai?

Born Pichai Sundararajan in 1972 in Chennai, Tamilnadu, India, Pichai joined Google in 2004. He rose from his role as a middle-manager to effectively become CEO Larry Page's number two. With a Bachelor of Engineering degree from IIT-Kharagpur, an MS from Stanford and an MBA from the Wharton School of the University of Pennsylvania, he is certainly capable – and now he is CEO of Google, replacing Page who becomes CEO of the parent company Alphabet.

He was initially responsible for Chrome and Chrome OS as well as Google Drive and in 2013, he began to oversee Android. One of his biggest, earliest innovations was a toolbar that enabled Google to make its search engine the default option on Internet Explorer and Firefox. Fear that Microsoft would make it difficult to install this toolbar led to the development of Chrome.

"Sundar has been saying the things I would have said (and sometimes better!) for quite some time now, and I've been tremendously enjoying our work together," says Page. "He has really stepped up since October of last year, when he took on product and engineering responsibility for our internet businesses. I feel very fortunate to have someone as talented as he is to run the slightly slimmed down Google and this frees up time for me to continue to scale our aspirations."



Google can be more flexible and innovative. Page and Brin can make quicker decisions and make some new bets. So can the CEOs beneath them.

Indeed, last year, Page said that the idea was to build Google's core business while also getting the next generation of big bets off the ground. "As you 'age' – even when you're still a teenager like Google – you have to work hard to stay innovative," Page wrote in the memo, which was obtained by *The New York Times*.

So far, the market has reacted well to all of this. The value of the overall company rose 5% on the announcement of the changes, which means Wall Street feels this will be a good financial move if nothing else. By freeing up the different business components to work independently and grow in their own way, though, we should also see internal competition as well as external. That will, in turn, make Alphabet richer and should convert into a wider range of potential services and developments for us all to enjoy too. [mm](#)



# Product Showcase

Four fascinating pieces of tech available right now

## Screeneo

A smart, short-throw projector from Philips, the Screeneo can produce images from 50" through to 100" and support 3D content. What's more, it only needs to be 44" away from the wall to get up to that 100" screen size!

It has integrated speakers and subwoofer, as well as wired and wireless network support. Indeed, connectivity is one of its real strengths, with support for HDMI, USB, Bluetooth and more. In addition, you can stream your music to the Screeneo, or use it to mirror content from your tablet or smartphone.

With a native resolution of 1280 x 800, the Screeneo is portable and powerful, as useful in the lounge as it is for setting up an outdoor cinema in the garden! It's on sale now.

**Price:** £799

**Manufacturer:** Philips

**Where to buy:** Currys, online stores



## PicoPix

A range of pocket-sized projectors with built in memory that you can take on your travels with you! So if you fancy loading up a movie or two to take on holiday, it's easy to do so.

The PPX3614, shown here, comes with a built-in MP4 player, 4GB internal memory, integrated 1W speaker and a headphone jack. Connect to your content device via HDMI, USB, Bluetooth or use its Android platform to connect to Internet.

For those who need to work while on the move, this PicoPix also has Windows' office suite built in. With an internal rechargeable battery, it can work alone or connected to a mains supply. The PPX3614 packs plenty of flexibility into its compact casing

**Price:** £339.99

**Manufacturer:** Philips

**Where to buy:** Currys, online stores



## Wavewall Cases

This is a mobile phone case that's been targeted more towards men, for reasons that's will become obvious. First and foremost, though, the job of the WaveWall is to protect your mobile phone – so it's a case that's easy to slip your device into in order to protect it from accidental damage.

There's a second function, though: to shield the male nether regions from the threat of the radiation that a mobile phone produces. The WaveWall is designed to mitigate the potential damage to male fertility that said radiation can cause. In fact, the case can reduce the mobile phone radiation that said nether regions absorb by more than 85%.

So, if you're the kind of person who keeps your phone in your trouser pocket, and are planning a family at some point in your future, the WaveWall may be just the ticket.

**Price:** £24.99

**Manufacturer:** WaveWall Cases

**Where to buy:**

[www.wavewallcases.com](http://www.wavewallcases.com)



## Modecom FreePC

Comfortably one of the smallest practical computers we've ever seen, the Modecom FreePC is the size of a USB flash drive, yet packs inside it the power of a far bigger machine.

Running Windows 8.1, the FreePC is aimed at home users, commuters and office workers, and comes with a quad-core Intel Atom processor, 2GB of RAM, 16GB of internal flash memory (a micro SD card reader offers more) and integrated HD graphics. Bluetooth support is offered too.

Simply plug it directly into a HDMI port on your display, provide it with a USB power source, and you're up and running in pretty much no time. It's on sale now.

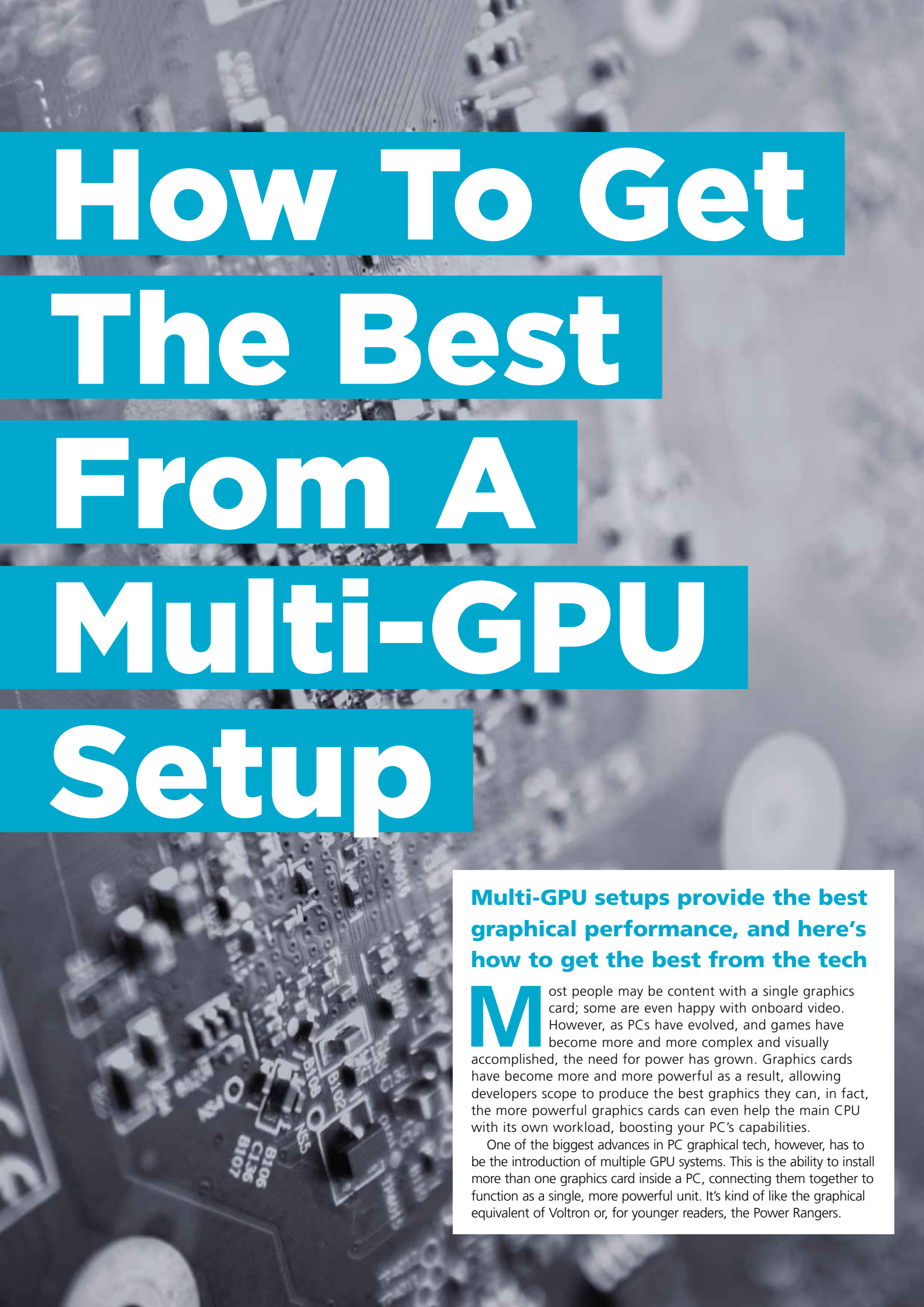
**Price:** £129.99

**Manufacturer:** MODECOM

**Where to buy:** Amazon, online retailers







# How To Get The Best From A Multi-GPU Setup

**Multi-GPU setups provide the best graphical performance, and here's how to get the best from the tech**

**M**ost people may be content with a single graphics card; some are even happy with onboard video. However, as PCs have evolved, and games have become more and more complex and visually accomplished, the need for power has grown. Graphics cards have become more and more powerful as a result, allowing developers scope to produce the best graphics they can, in fact, the more powerful graphics cards can even help the main CPU with its own workload, boosting your PC's capabilities.

One of the biggest advances in PC graphical tech, however, has to be the introduction of multiple GPU systems. This is the ability to install more than one graphics card inside a PC, connecting them together to function as a single, more powerful unit. It's kind of like the graphical equivalent of Voltron or, for younger readers, the Power Rangers.





▲ The two main multi-GPU technologies are provided by Nvidia and ATI

By connecting two or more GPUs together via their corresponding interface (Nvidia and ATI have different connections), you increase the graphical power of the system by two – or more, if you go for an even more impressive setup. The system has the ability to utilise all of your cards' power, thus allowing more impressive detail, higher frame rates, and a generally superior performance.

Of course, it's not as easy as just buying two (or more) cards and installing them. There are other considerations you need to take into account and, once installed, there are further steps you can take to get the most out of your new multi-GPU setup. So, let's take a look.

### Is It Worth It?

The first question you need to ask yourself when considering a multi-GPU setup is whether it's worth the hassle. The answer to this will depend greatly on your use for the PC. If you're not a gamer, or power user, then no, of course it's not. If you simply use your PC for social media and Internet browsing, maybe even a little multimedia, you'll probably not even be pushing your current, single-GPU setup. This being the case, it's not worth the time, effort, and more importantly, cost.

However, if you're reading this, and if you're thinking about multi-GPU options, it's probably safe to say you're into gaming at the very least, in which case, multi-GPUs are undoubtedly worth it. There are many reasons for this, with the chief one being the guaranteed boost in graphical horsepower. This will give you a huge leap in speed, texture detail, FPS, and more. You'll be able to run games at very high detail levels and resolutions, whilst still maintaining a smooth frame rate. Dual and higher card setups are also a great idea if you're planning to run at 4K resolutions, so it's well worth considering this if this is the case.

What's more, if you shop around, there's no need to spend a fortune. Even two mid-range cards will usually yield great results, so you don't necessarily need to spend large amounts of cash on the best, high-end models. Depending on your current system, though, you may need to upgrade your motherboard.

### Preparations

In order to utilise a multi-GPU setup you'll first need a motherboard that's capable of handling this. If your system isn't that old, you'll probably already have the option to install at least two GPUs, but it's always worth checking before you rush out to buy a couple of new GPUs.

It'll be very apparent, as your documentation will clearly state this, along with the kind of dual GPU tech the board supports. The board will also have ample space for additional GPUs. The two main options here are Nvidia's SLI (Scalable Link Interface), and ATI's Crossfire. These are similar technologies, but deal with

each of the vendor's hardware, so be sure to check which your board supports. Many will handle both, but you should check just to be certain.

Another important consideration is your PC's case. You're going to need a case that has enough room to house the multi-GPU setup, and if you plan to buy high-end cards, which are usually much larger in size, you'll need plenty of room not only to accommodate the cards themselves, but also to help with airflow, as you'll be generating a lot of heat (which we'll come to later).

“ The first question to ask yourself when considering a multi-GPU setup is whether it's worth the hassle ”

Additionally, you should double-check your power supply specifications, and ensure that it can provide enough power to your system. If you use a limited PSU, you'll run into problems. A rough recommendation would be at least 800-1000W, but this can vary depending on the hardware you choose.

Assuming this is all taken care of, you're free to go looking for your multiple GPUs., but you need to take into account the limitations of SLI and Crossfire tech. Both deal with GPUs differently in terms of mixing and matching graphics cards. Crossfire is a little more flexible, whilst SLI is not as forgiving.

If you're using Nvidia's SLI tech you'll need to ensure that your GPUs are the same model, as mixed models won't work. The models can be from different manufacturers, though, as long as you ensure the model is the same. So, for example, you



▲ Not all motherboards support, or are suited to multi-GPU setups, so check your is before you buy new GPUs





▲ A good amount of power is needed if you want the best performance from your GPUs

could use a GTX 460 from Asus and a GTX 460 from Gigabyte together, but not a GTX 460 and a GTX 470, as the model and chipset is different. It's also important to note that one card can be overclocked, whilst the other isn't (again, more on this later), but the overclocked card may be slowed to match to other, non-overclocked card.

“ You may think that multiple GPU systems are a relatively new technology, but you'd be wrong ”

For ATI's Crossfire you can be a little more flexible. Here you can mix and match different models, as long as they're in the same series. So, you could use a 7950 model with a 7970, but not a 7850 with a 7950, as this include card from two different series.

### Simple Things

Once you have your cards, and have installed them in your PC, you'll probably hit one of the most common questions first-time multi-GPU users ask: which of the cards you should connect to the monitor?

The short answer here is 'any'. It doesn't actually matter which of the cards you connect to your display, as all cards are connected and shared by the system, so any will work fine. However, there is a more detailed answer that you may want to consider in terms of getting the most from your multi-GPU setup, and it involves overclocking and heat.

In most systems, the top-most of your GPUs will be the one that experiences the most heat build up. This is because, as any school kid knows, heat rises. If you're running overclocked cards, this will only exacerbate the situation. When you pair this with the monitor connection, it can make things even worse. As the card connected to the monitor is going to be doing slightly more work, as it has to actually output the image, it'll generate a little more heat. It's negligible, but it's there. For this reason, many expert users choose to connect their display to the lower card, as this is usually the coolest, and therefore helps keep your system that little bit cooler.

### Voodoo People

You may think that multiple GPU systems are a relatively new technology, but you'd be wrong – at least technically. Multiple GPUs were used much earlier than you may think in mainstream gaming.

Back in the early 90s, PC gaming was entering a new era. 3D graphics were becoming more and more advanced, and to facilitate this, new 3D graphics hardware had to be created. At the time, most users had only 2D graphics cards, and to embrace the new wave of graphics, a second, '3D Accelerator' was needed. One of the most popular and successful cards of the time was the Voodoo from 3DFX. No defunct, 3DFX cards were installed and connected to existing 2D cards with a special loop back cable. This paired the two cards, allowing the PC to make use of both the traditional GPU, and the enhanced 3D chip. The Voodoo 2 is arguably the most successful card of this era, but many more were made.

In fact, you could even use multiple Voodoo chips. The Voodoo 2 made use of SLI (then called Scan-Line Interleave) long before Nvidia absorbed the tech (Nvidia bought a good deal of 3DFX when it folded).

3DFX went bankrupt in the late 90s, partly due to the decision to only support Glide and OpenGL graphics, instead of DirectX, which would go on to become the *de facto* tech.



▲ The Voodoo 2 was amongst the first dual-GPU setups

Indeed, cooling should be a major concern if you're going to run multiple GPUs, as you'll generate a lot more heat. Aside from the main CPU, graphics cards will generate the most heat in your system, so having more than one will greatly increase the hot air you'll need to shunt out of your PC. Because of this, you'll probably need to invest in better cooling. If you have a large enough case with good airflow, you should be able to fit more case fans, and this is important, especially so if you plan to overclock, which is one of the best ways to get the most from your multi-GPU setup.

### Overclock

Having multiple GPUs installed will instantly give you a better level of performance than a single card, so right from the off you should be happy. However, now that you've spent more money, and spent the time setting up the system, why not get even more out of it, for free? Overclocking isn't anything new, and most PC users will be familiar with it. It's also a great way to increase your



# Lethal speed, deadly precision.



## AOC G2460PG 24"

G-SYNC™ Gaming Monitor

- 144Hz
- 1ms Response Time
- Display Port
- Nvidia 3D Vision Ready



## AOC G2460FQ 24"

- 144hz Monitor
- 1ms Response Time
- Display port, DVI, HDMI, VGA



## AOC G2460PQU 24"

- 144hz Monitor
- 1ms Response Time
- Display port, DVI, HDMI, VGA
- Height Adjust
- 4 x USB ports



## AOC G2770PQU 27"

- 144hz Monitor
- Display port, DVI, HDMI, VGA
- Height Adjust
- 4 x USB ports

[www.aoc-europe.com](http://www.aoc-europe.com)





▲ **Cooling is essential, be it case fans or GPU-mounted methods, such as this water-cooled option**

multi-GPU performance, easily gaining more general performance and an increased frame rate. To do this, you'll need a good overclocking program designed for GPUs. Both Nvidia and ATI have such programs, which you can download from the respective websites, but you can also get other vendor-specific models that'll work with other cards. A popular, and very easy to use example is EVGA's Precision. This can be grabbed from [www.evga.com](http://www.evga.com). You'll need an active registered account to download it, but this is free. Once you register, you can download and install the tool.

The program features an attractive speedometer-style interface, and all you need to do to make changes is use the various sliders to alter your card's settings. Sliders deal with fan speeds, voltage, power and temp targets, clock speed, and memory clock speed. You can instantly test settings out, apply them, or set them back to default. Several profiles can also be set up and saved, so you can create different overclocking configurations for specific tasks. The program also lists each GPU installed in your system in the bottom-right.

When you begin to experiment here, always heed the old-hand overclocking mantra of slowly, slowly. Don't be tempted to simply max out your GPU and memory speeds, as this may simply end up making your system unstable. Instead, you have to take a slow, careful approach, gradually increasing clock speeds and testing them until the system becomes unstable. This way, you find your hardware's limits, and you'll know how much you can safely push your hardware. With this in mind, let's take a look at the specific settings.

First we have the fan speeds. This will deal with the fan speeds mounted on your GPUs. Usually, you'll want a higher speed here, as this will have the best effect of system cooling. However, it'll also make more noise and use a little more power. If you're really pushing the hardware, though, keep this high.

Increased voltage can help deliver better results, as more power supplied to the hardware will enable it to operate at higher speeds. This will, of course, generate more heat, however, and some hardware simply isn't designed to handle higher voltages, and in a worst case scenario, you may cause damage. This is one setting you really need to use carefully, making slow increases.

The power and temperature targets are set to allow the software to throttle back settings if needed. For example, if the temperature target is exceeded, meaning too much heat is generated, setting will be throttled to generate less heat.

The most important settings, though, are GPU Clock and Mem Clock. These deal with the currently set GPU and Memory clock speeds, and by increasing them you can squeeze out extra performance from your hardware. To do so, simply move the sliders to increase the speeds in small increments, and then test each. This is best done with some form of benchmark program running, so use whichever one you prefer and observe for any performance increases. Benchmarks are also useful for spotting problems, such as graphical artefacts due to overheating, slow performance, or instability.

Going back to the voltage setting, some users will also use less power for various reasons, one being the generation of much less heat. This is a good tactic, but is also a problem, as too little power can also cause instability, and at the very least, will negatively impact performance.

Other simple tips for overclocking include performing the actual overclocking in a cool room, perhaps with your case open. This won't reflect general use, and you do need to test this, but it makes for

“ **Increasing memory speed will give you some increases in performance, but not as much as the actual GPU clock** ”

a safer test bed to work with your first couple of times, until you get more experienced and what your PC's limits are. It's also a good idea to have a couple of actual games installed and ready to go, particularly graphically demanding ones. Benchmark tools are great for evaluating your GPU's performance, but there's no better way to test your changes out than to actually play a game. So, do this in between increments to see what actual, practical improvements you're making.

Be aware that increasing memory speed will give you some increases in performance, but not as much as the actual GPU clock, and memory speeds will also require more power. Some users prefer to leave this in order to save power, but this is subjective, and there are differing opinions.

By gradually increasing the speeds, you'll end up with even more power from your multi-GPU setup, meaning you'll have no problems running games at their very best. **mm**



▲ **EVGA's Precision is an easy to use overclocking program that can help you get the most out of your multi-GPUs**





LAPTOPSCREEN.CO.UK



Our Ratings!



# BRAND NEW SCREENS

Over 47600 screens in stock



Find screens for Laptops, Tablets, Smartphones

SEARCH



[www.laptopscreen.co.uk](http://www.laptopscreen.co.uk)

We ship from London Gatwick, UK 

UK delivery from **£3.99**

EU delivery from **£8.99**





# Can An App Make You More Productive?

There are countless so-called 'productivity apps' on the market, all claiming that they can force you out of procrastination and into a state of unbridled target-accomplishing bliss. **Rob Leane** asks: do any of them actually work?

**T**he term 'productivity app' may seem like a misnomer, seeing as most apps available these days tend to have the opposite effect. Between this writer's phone and his laptop, there's enough downloaded content to stop me from ever doing any actual work. My phone tends to be filled with the likes of *Candy Crush*, *Words With Friends* and an ever-growing myriad

of social media platforms. These regularly combine into a super-effective distraction device, more than anything else.

It's lovely to imagine a world where this isn't the case, though. Where your devices can serve the purpose of pushing you professionally and personally. Got a job that needs doing? Well, wouldn't it be great if your apps could actually help you, rather than hindering any chance of





**BREAK  
THROUGH**



AV1200 POWERLINES



**DELIVERING BLAZING  
FAST INTERNET**  
**WHERE WIRELESS WON'T REACH**

TELEVISION

**TP-LINK®** [uk.tp-link.com](http://uk.tp-link.com)



[amazon.com](http://amazon.com)

[broadband  
buyer.co.uk](http://broadbandbuyer.co.uk)



[Currys PC World](http://CurrysPCWorld)

[ebuyer.com](http://ebuyer.com)  
technology delivered

[SCAN](http://SCAN)





productivity? Of course it would. The real question is: where to start?

The market for productivity apps is already oversaturated. A brief search online presented five possible contenders for the productivity app crown, so I gave them a look in the hope of discovering one that's actually worth investing in...

### OmniFocus

One productivity app seems to have more recommendations than any other: OmniFocus. If you're a committed Apple customer, this software is targeted directly at you. It's only available on Mac, iPad and iPhone, and it claims to offer you a chance to "keep life and work in balance, stay on top of projects and goals, accomplish them faster, and play a little bit more."

**“ Once you get into the swing of it, however, there is a certain elegance to OmniFocus that arguably warrants the price tag ”**

If you're wondering what the catch is, there is the small matter of the price tag. OmniFocus doesn't come for free, it actually offers a range of pricing options – but for the standard Mac or iOS version, you'll need to splurge out at least \$40 (roughly £25) to get it. For the full 'pro' service, you can add another \$40 (for Mac) or \$20 (for iPad and iPhone's iOS). That, honest, is a hefty price to pay.

There is a free 14-day trial for the standard Mac version, though, so we gave it a look. On first glance, OmniFocus looks a little confusing. There's a series of tabs along the top bar, and a shed-load of other options down the left hand side of the screen. If you're the type of person who likes skipping the instructions and jumping straight into an easy-to-understand and ergonomic-to-use software, you may find yourself in need of a manual on this occasion.

Once you get into the swing of it, however, there is a certain elegance to OmniFocus which arguably warrants the price tag. Even at its most basic level, it has some handy features. At first it basically feels like a list-making service, helping you create a run-down of all the tasks ahead of you in the foreseeable future.

Once you delve deeper, though, you realise that you can time reminders for yourself, group tasks together into 'projects,' or even create a 'perspective' where only certain tasks are shown for you. If you struggle with juggling too many jobs at once, this feature is a godsend. If you're not working on a certain thing today, you can hide it, and get on with the other stuff. It will pop back up whenever you told it to resurface.



Personally, I found this pretty useful as a freelancer who does odd bits and bobs for various contacts. It's a great way to streamline your goals on a day-by-day basis. As the first app tested for this article, then, OmniFocus will be hard to beat on everything but the price tag.

### Things

As well as only being targeted at Mac users, Things also shares another significant feature with OmniFocus – a hefty fee for purchase. You should prepare to stump up \$50 (around £30) if you decide to pick this product up. Various versions of Things are available across Mac, iPhone, iPad and the Apple Watch. Again though, there's a free trial that lets you try before you buy.

Things opens up without much fanfare, appearing like a fairly simple list app. The menu down the left-hand side tells you the available categories: today, next, scheduled, someday and projects. There's also an inbox for as-yet-unfiled tasks and a logbook were already-completed jobs are stored for future reference.

There's a lot of similar features to OmniFocus here, including the 'tag' function, which can be used as Things' version of the afore-discussed 'perspectives' option from OmniFocus. Only working on personal jobs today? Then click into the 'personal' tag and you won't see by your list of work tasks anymore. Unlike OmniFocus' perspectives, though, Things' tags are always in view.

If I had told OmniFocus not to bother me with work stuff, I wouldn't be able to see any reference to work at all. On Things, I can still see the word 'work' at the top of the screen, regardless of my commands. It's a tiny difference, but it's enough to mean that work still looms over you when you're not meant to be thinking about it.





On the upside, though, Things does have a nice 'someday' feature where you can easily shove odd jobs for an upcoming rainy day. There's also the ability to press the 'not today' button and dismiss a task that you won't get around to until tomorrow.

My favourite feature of Things is probably the 'energy' option, though. That lets you define the difficulty of a task so that, at the end of a tough day, you can get it to provide you with a quick reminder of what 'easy' jobs you have left. That comes in very handy on Friday afternoons when you can't face a much tougher task than sending a few emails. It may not be worth thirty quid of your money, though.

### 30/30

In the light of what's come before, the first – and possibly the most – important thing to note about 30/30 is that downloading it won't cost you a penny. Yes: It's free! There are optional in-app purchases, though, that could add up if you're not careful – and 30/30 lacks a desktop version. It's only intended for iPhone, iPad and iPod Touch.

I downloaded 30/30 onto my fairly bog standard iPhone 4c, and I'm happy to say that I won't be deleting it any time soon.

Also, I've managed to use it for a week or so without incurring any of those in-app charges that the App Store warned me about upon download.

Immediately, you'll be struck by the fact that the user interface seems unique and interesting, which puts 30/30 ahead of both OmniFocus and Things in terms of attention-catching design. Whether or not that's a good thing is up for debate, as there's an argument to be made that a brightly coloured productivity app could become more of a distraction than a helper. However, that's not the case here.

In fact, 30/30 is clearly targeted at people with short attention spans – which, frankly, suits this writer down to the ground. As such, the whole system is based around allotting time for your tasks and setting yourself a series of micro-deadlines every day. For example: my list of jobs on the day of writing this article looked like this: write article pitches – one hour, write productivity article – three hours, buy and wrap nephew's birthday present – two hours. Spoiler alert: I got all those things done.

“ The whole 30/30 system is based around allotting time for your tasks and setting yourself a series of micro-deadlines every day ”

You can break your day down into even smaller tasks if that suits your style and purpose (like 'read report – 20 minutes' or 'email Steve – 5 minutes,' if you like). If you're a short-attention-span type of guy, like me, these micro-targets can really help you get momentum going in the morning and maintaining it through the span of a day. A timer in the middle of the screen will remind you how long you have left of the time you set aside for your current task, which can add a bit of urgency to proceedings.

If something comes up and you need to switch tasks, you can do that, too. 30/30 will remember how long you had to go on the previous task and will resume the timer when you get back to it. As a freelancer who does a lot of work at home, setting myself strict daily guidelines in this way came in very handy. It may not work for everyone, but it really worked for me.

### Evernote

The main, original Evernote app is fairly brilliant – it's a note-making and task-management service that can be used individually or by whole businesses. Evernote also offers a wide range of other apps. These can help all sorts of different people get on top of their daily to-do list.

Whether you champion a good old-fashioned to-do list or prefer to manage your day in a more specific style (e.g. by the hour, or by project, or by team), there's probably an Evernote app that suits your style.

For those who don't want to fill their phone with any more notifications, Sunrise Calendar turns your notes into reminders and syncs them directly into your calendar, meaning that all your upcoming events – from meetings, to solitary tasks, to birthday parties, will all be stored in the same place.

There's also Swipes, which makes the information that your store in Evernote actionable and task-orientated. For people who love the feeling of ticking something off a to-do list, Swipes is a solid app equivalent

that's much shinier and sleeker than your boring old Notes app, and it lets you categorise tasks in a variety of ways, too.

You can use Cloze in conjunction with Evernote, as well. This lets you assign your notes to specific contacts and groups, which can come in very handy if you have a lot of tasks going on at once.

Also from Evernote, CloudMagic lets you create notes from your emails with the tap of a touchscreen; SwiftKey helps you write notes quicker; Boxer is Evernote's version of Dropbox; and IQ Tell combines various services to help you get through tasks faster.

All in all, Evernote is trying hard to dominate the productivity game, but we'd say the original app is still the best. The original Evernote is available for Windows and Android, too, making it a bit more all-inclusive than most of the products on this list. The free basic version is definitely worth a trial run.



## Asana

Available via Android, iOS, or as a browser-based online service, Asana is all about avoiding the hassle of messy internal communications. If you're fed up of searching your inbox for that one elusive piece of information that's hidden in an elongated thread from several months ago, this is the app to try out.

As the Asana website puts it, everyone in your team probably spends hours "reading, writing, sorting, searching, filtering and forwarding emails – it never ends." It doesn't have to be that way, though. Essentially, Asana's aim is to simplify these office tasks.

to draft documents, and everyone will be notified. It's not unlike a social media platform for projects, in that way. You wouldn't need to download a document from an email, make your edits, change the title, re-upload the document and send it off in a different email. Asana has cut a lot of steps out for you, there.

As long as your team consists of fifteen-or-less people, Asana is free. If you want more from the service, there's the option to pay a premium fee for some extra features. Even the basic option is pretty useful, though, as a way to bypass email faff and get straight to the work that needs to be done.



“ The fact that you can view Asana on any device with web browsing capabilities can come in handy, too, especially when the need arises to work from home ”

The idea here is that your whole team would download Asana, and use its simple interface to create projects, set deadlines, post comments, and assign tasks. This service makes it a little easier to communicate important information and to make sure everyone is on the same page, rather than relying on lengthy and confusing email threads.

In Asana, communication and tasks are all on the same place. Edits can be made

The fact that you can view Asana on any device with web browsing capabilities can come in very handy, too, especially when the need arises to work from home or to join an important discussion while on the go.

## Final Thoughts

In the battle of the productivity apps, it's impossible to choose a decisive winner that will work perfectly for everyone. After all, everyone does different jobs, in different

environments and finds different difficulties that stop them from firing on all cylinders.

For me, the biggest problem is my attention span. I'm the kind of person who, even if I'm watching TV, will probably pause it a few times during the episode to browse Facebook. If that's what I'm like in my free time, you can imagine what I'm like when I'm actually trying to do work.

While I'll sometimes build up a good head of steam, equally often I crash and burn. The best app to help me, and the only one of these that I've kept on my phone, is 30:30. Its advantage, for me personally, is the timer in the middle of the screen. It clearly tells me what I'm meant to be writing and how long I have left to finish it.

If I get bored of that, I normally have a few emails to send on any given day, so I'll switch to that task instead. The timer will change, and it'll give me thirty minutes to do emails before switching back and telling me to get on with my writing. It almost feels like a computer game, with various side missions taking shape in the form of my targets.

The result – shockingly – is that things get done. By helping me think about various types of work as different colour-coded targets, with set time limits, 30:30 encourages me to work at a better speed than I usually would. I've been using it for about a week, and it seems to be helping.

As I said before, though, some people just love that good old-fashioned feeling of ticking something off a list. There are apps that can do just that (Evernote's Swipes – or Clear, another list app that we didn't have space to cover), but if you're good at sticking to a list, you'll do just as well with a pen and paper.

If you work in a large team in a big office with a complicated working situation, you might find OmniFocus, Things or Asana useful. For me, though – a freelancer with a tiny attention span – nothing works better than 30/30. [mm](#)







**MODECOM**

**PUT YOUR PC COMPUTER  
IN YOUR POCKET  
AND TAKE IT EVERYWHERE.**

## MODECOM FreePC Mini PC

Free PC is the latest generation of mini-computer. Although it's only the size of a USB flash drive, the FreePC still has all the power and performance of a normal sized PC. The MODECOM FreePC is equipped with a powerful quad-core processor power Intel® Atom Bay Trail-CR Z3735F with 2GB of RAM and integrated Intel HD graphics. MODECOM FreePC runs off Microsoft Windows

MODECOM FreePC is an incredibly small device that makes it possible to turn your PC or monitor into a big screen Personal Computer. The combination of new generation components with stylish design and compact size creates an office tool that fits in every pocket. Simply plug FreePC into an available HDMI connector on your TV/monitor, connect it to a power source via USB, and in seconds you will be have access to the rich world of multimedia entertainment. With an Internal flash disc capacity of 16GB there is plenty of space for your favourite multimedia files (movies, photos, music), however the internal storage can easily be increased by using the built-in micro SD card reader with support up to 32GB micro SDHC

MODECOM FreePC is also an excellent device for business solutions. Featuring Bluetooth 4.0 the device is portable and can easily be connected to peripheral devices such as mice and keyboards.



### Energy-saving and environment-friendly technology

In MODECOM FreePC we put very efficient components making it a mini-size personal computer, while having a low demand for electricity.



### High-capacity 16 GB Flash disk for your favorite multimedia files

Internal flash disc with capacity of 16GB, let you store large amounts of your favorite multimedia files ( movies, photos, music).



### Micro SD/SDHC card reader supporting up to 32GB

Internal storage can be enlarged easily by using built-in microSD card reader with support up to 32GB micro SDHC. This means a maximum total of 40 GB.



### Two USB 2.0 port (one USB mini, second USB micro)

Thanks to this feature, FreePC can works with an external 3G modems. It means that thanks to this device and 3G modem, you can browse the Internet always where you in range of your mobile operator network. You can also easily connect external hard disk, pendrive or other accessories like mouse or keyboard.



**PXS DISTRIBUTION**

ENDLESS SOLUTIONS

UK • GERMANY • SOUTH AFRICA • KENYA

• 0844 879 4212  
• sales@pxsdistribution.co.uk  
• www.pxsdistribution.co.uk





# Remembering...

## Amstrad Sinclair PC200

This week, we check out an unfamiliar PC with a familiar name

**B**ack in 1988, Amstrad had the idea that people may want to actually have a portable version of an IBM PC, and thus the Amstrad PPC512 and the Amstrad PPC640 came into being. Both had an 8MHz NEC V30 processor, 512KB of memory, a full-sized keyboard and a tiny LCD display. They both ran MS-DOS 3.3, and featured a number of business-based software packages.

While good, by the standard of the day, they didn't sell too many. So the technical boffins at Amstrad instead dreamed up a desktop version of the PPC range, and replaced the LCD section of the computer with an RF modulator while encasing the keyboard and main system components in a black, Amiga and ST-like chassis. This was the Amstrad Sinclair PC200.

Although Sinclair in name (with black enclosure and Sinclair logo), it bore little family resemblance to the historic brand – except, that is, for its sales figures, which were probably uncannily like that of the QL.

### Its History

The Amstrad PC200 was launched at the PC Show in October 1988, a show that also featured Ocean showcasing *Rambo 3*, *Operation Wolf*, and *Robocop* – and, if I remember rightly, a brief appearance from Maria Whitaker, reprising her role as the princess in *Barbarian 2*. So, the Amstrad PC200 had some stiff competition for attention.

The idea behind it was simple enough: Amstrad already had a gazillion other IBM PC models launched, or about to be launched, so the company decided on using the Sinclair name it had bought some time ago in a last bid effort to win over the former Spectrum fan base. It didn't work. Although the PC200 had a reasonable specification, with an 8MHz 8086 CPU, and the option to fit the 8087 Maths Co-Pro, plenty of memory, a Centronics port, RS232, DOS 3.3, and a built-in 3.5" 720KB floppy drive, it unfortunately bombed due to a number of factors.

Firstly, while there were ISA expansion ports, due to the low profile height of the case to actually have any hardware of the time fitted into them you needed to have the case lid permanently opened (there was a hinged lid). Secondly, it only had 16 colours and a beeper sound. Thirdly, it was going up against the Amiga and the Atari ST at the time. Finally, it cost £300.

### Did You Know?

- There was a modem/FAX version released just before the PC200 was eventually pulled from the shelves
- It came with a half-decent Sinclair-branded SPJ-1 joystick
- It had a good full-sized keyboard, with F-keys too
- There were rumours that Amstrad were working on a Transputer Card for the PC200
- With a colour monitor, and FAX capabilities, the PC200 cost up to £499

It did though have the rather groovy ability to connect to a standard TV, inherited from the former Sinclair range of home computers – something that was lacking from other IBM compatible PCs at that time, at a time before TVs started to feature connection that married up with a PC. *Your Sinclair* found it a revelation, and considered the PC200 to be a machine with a very bright future. The rest of the universe, *Crash* included, said that if you're serious about computing, then you would be much better off with either an ST, any other IBM PC, or an Amiga. Time has shown them to be right.

The end result was a machine that was removed from the shelves within a few months, and now only sees the light of day through the glass cases of a computer museum.

### The Good

It had the Sinclair logo! Plenty of IBM/DOS software for it.

### The Bad

You had to permanently have the chassis open, and the cards exposed to fit any ISA components. It lacked the power to actually have two ISA cards fitted (although I never tested that theory).

### Conclusion

It was a fairly brave last ditch attempt at rekindling the Sinclair name. Sadly, though, the Sinclair generation had all grown up and moved onto ST's and Amigas.



▲ The Amstrad Sinclair PC200. Looking back, it was actually quite a cool machine



▲ With a monitor though, it did get a little pricey



▲ It came with a good Sinclair branded joystick, though



# Component Watch

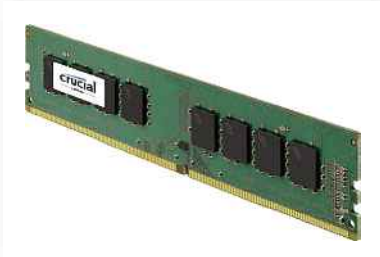
**If you're thinking of moving up to a Skylake processor, and the new Z170 chipset motherboards, you're going to need some DDR4 RAM...**

When it comes to RAM, while there's still life left in DDR3, DDR4 is becoming an increasingly popular option when people have to upgrade. It's still a premium purchase, and probably will be for a little while longer, but its increased speed and capabilities mean that the benefits can be impressive, especially if you're putting together a high-end system that values such factors. So, if you're ready to take the plunge, and want to make sure you pay the lowest possible price for your next big system bump, then you need to check out these DDR4 deals.

## **Deal 1: Crucial 4GB DDR4 [CT4G4DFS8213]**

**RRP: £34 / Deal Price: £22**

Crucial's 4GB DDR4 DIMM is the cheapest around, and that makes it ideal for those building lots of systems or upgrading theirs on a budget. This 2133MHz PC4-17000 RAM is double the speed of



DDR3 and up to 40% more energy-efficient – so you don't need to worry that buying cheap will reduce the likelihood of seeing any improvement in performance. It's perfect for entry-level DDR4 buyers; though the elevated RRP price makes the deal look better than it is, especially when you compare it to the Crucial Ballistix deal below.

**Where to get it:** Ebayer ([bit.ly/1TVa6eB](http://bit.ly/1TVa6eB))

## **Deal 2: Crucial Ballistix Sport 4GB DDR4 [BLS4G4D240FSA]**

**RRP: £25 / Deal Price: £22**

If you want something a little more highly specified – perhaps because you're building a gaming system – but still want to get good value for money, the Crucial Ballistix Sport might



be exactly what you're looking for. This 2400MHz, PC4-19200 RAM balances speed and price extremely well, and it's also got a good-looking case to make handling it that little bit less risky when you undertake the install. We'll grant you that the grey styling cannot be considered as a very sporty colour choice, but at least it goes with pretty much everything! While it's easy to sniff at a £3 discount, at least it's something.

**Where to get it:** Ebayer ([bit.ly/1JivTLJ](http://bit.ly/1JivTLJ))

## **Deal 3: Kingston ValueRAM 4GB DDR4 [KVR21N15S8]**

**RRP: £49 / Deal Price: £23**

Kingston's ValueRAM is some of the most respected in the industry, and its DDR4 modules are no exception. These 2133MHz, PC3-17000 units stack up well against the competition without breaking the bank. They even have gold contacts for greater fidelity. Admittedly they're a



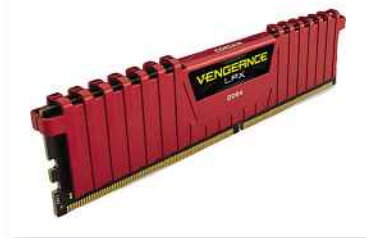
little more expensive than some of the competition right now, but that could change at any moment. It's always worth keeping an eye on in case the price drops a few quid to below Crucial's!

**Where to get it:** CCL ([bit.ly/1ECxoPz](http://bit.ly/1ECxoPz))

## **Deal 4: Corsair Vengeance LPX Red 4GB DDR4 [CMK4GX4M1A2400C14R]**

**RRP: £30 / Deal Price: £26**

Gamers looking to overclock their systems will want some slightly better RAM, and Vengeance LPX 2400MHz, PC4-19200 memory is both inexpensive and aimed at high-performance overclocking, with a pure aluminium heatspreader and eight-layer PCB to help keep it cool. Available in multiple colours, red is the least expensive so snap it up at a reduced price today.



**Where to get it:** Scan ([bit.ly/1E3JF4R](http://bit.ly/1E3JF4R))

## **Deal 5: Kingston HyperX Fury Black 4GB DDR4 [HX426C15FB]**

**RRP: £38 / Deal Price: £26**

The fastest RAM we've looked at is the Kingston HyperX Fury Black, rated at 2666MHz, PC4-21300. It has full XMP support and low-latency modules, aimed at providing high performance at low costs. Give the small price differences between RAM modules at this



end of the market, we'd advise anyone who can afford it to start with these, whether you're an overclocking enthusiast or not!

**Where to get it:** CCL ([bit.ly/1PmaliX](http://bit.ly/1PmaliX))





## My Hard Drive's Bigger Than Yours

Samsung reveals whopper

---

# Dell Goes Professional With Chromebook

### Lucky 13 for Google collaboration?

If Google's Chromebook concept has a rosy future ahead of it, surely it's going to be thanks to models such as this promising, professional-focused Chromebook 13 from Dell. In the press blurb, Dell promises the typical "sleek design, superb performance", but its swagger is backed up with some decent specs for the 13.3" notebook.

Driven by Intel Celeron, Core i3 or i5 processors depending on which version you go for, the starting price of these is \$399. Unfortunately, when it comes to the UK come October, that will translate to somewhere between £350 and £399 for basic model in the range. That is by no means a bad price, but a number closer to the actual exchange rate equivalent would be even better (currently \$350 is about £225).

With up to 8GB system memory (although the entry-level option does offer just 2GB), up to 12 hours battery life, backlit keyboard, 720p webcam, wi-fi and Bluetooth 4.0, USB 3.0 and 2.0 ports, plus a full-size HDMI port, SD card slot and a 1080p Gorilla Glass touch display, this sounds a promising business-centred option.

You can see more over at [www.dell.co.uk](http://www.dell.co.uk).



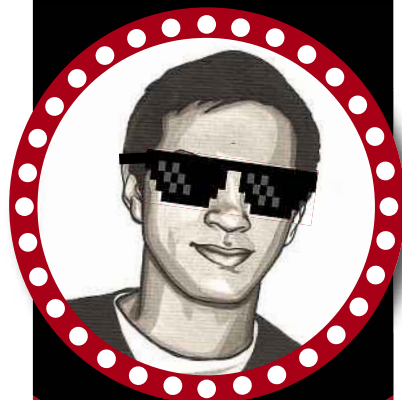


**C**an there be three more boring words in computing than Flash Memory Summit? Really, at times the technology industry doesn't do itself many favours regarding how it is perceived by the wider public.

Anyway, this year's thrilling event in sunny California (at least everyone gets to go somewhere exciting to attend it, and maybe have a day out at Disneyland while they're there) was notable for Samsung unveiling the world's largest hard drive. Now that's a bit more like it.

Obviously aimed at the enterprise market, the PM1633a drive stores a whopping 16 Terabytes of data within its 2.5" SSD unit that utilises Samsung's new 256Gbit NAND technology..16TB of SSD! Well, 15.36GB of usable storage, anyway... That, dear readers, is still a lot of movies and MP3s.

So, while the event itself was likely a total borefest for anyone without a PhD of some variety or another, at least it did provide a world-first... Even if the chances of you finding one in your next laptop are minimal for the next couple of years. You never know, though...



**Anthony is on holiday this week, so this is John filling in... Hello!**

There are a lot of companies that were once part of the brave new world of online services now desperately trying to adapt themselves to being the older kids on the block. In the same way that most of us, at some point, have to put away childish things and get out there and earn some money, companies like Reddit, Gawker Media, Facebook and Twitter are all now trying to mature in a way that will allow them to justify the massive amounts of cash that have been invested in them.

Google's never really struggled with the making money bit, but it's re-jig, under the new banner of Alphabet, indicates a wish to grow up and diversify into new areas, as we examine in our lead feature this week. Let's just hope it doesn't give it carte blanche to throw away that pesky 'don't be evil' ethos too, eh?

**Untill next week, then, and Anthony's return...**

*Bonus John*

Editor (in his dreams)

# Amazon Defends Culture

**New York Times' piece claims "bruising" workplace**

**W**hen *The New York Times* ran the headline 'Inside Amazon: Wrestling Big Ideas in a Bruising Workplace', the company was clearly going to have something to say about it. Especially as the feature made some big claims against the company, not least in describing it as "an experiment in how far it can push white-collar workers to get them to achieve its ever-expanding ambitions" and noted that employees are "held to standards that the company boasts are 'unreasonably high'."

Jeff Bezos had to respond, and he has. In a memo to employees, which has found its way online (of course), he wrote that the article "doesn't describe the Amazon that I know." Asking staff to read the article, he wrote in the memo that "It claims that our intentional approach is to create a soulless, dystopian workplace where no fun is had

and no laughter heard. Again, I don't recognize this Amazon and I very much hope you don't, either."

The memo signs off "Hopefully, you're having fun working with a bunch of brilliant teammates, helping invent the future, and laughing along the way." For his, and Amazon's, sake we hope they are too.

**amazon.com**  




# Meanwhile... On The Internet...

Well, there's only really been one big story in town lately, hasn't there? The massive hack on dating/doing-the-dirty site Ashley Madison was big news anyway, but when the hackers behind it made good on the a promise to make information it had removed from the site's servers public if Avid Media didn't shut it down, the story hit front pages around the world all over again. The amount of data is, frankly, pretty mind-boggling; a first batch amounted to 10GB when compressed, and contained details of something like 36 million accounts ([tinyurl.com/MMnet77a](http://tinyurl.com/MMnet77a)) – including, apparently, some details from accounts that had paid the controversial fee Avid charge to delete details from the site ([tinyurl.com/MMnet77b](http://tinyurl.com/MMnet77b)). However, a second release was even worse: an 18.5GB trove including what appears to be the source code for the site ([tinyurl.com/MMnet77c](http://tinyurl.com/MMnet77c)) and the CEO's emails.

The Madisoning (which, unsurprisingly, absolutely no-one has called it – but you're welcome), spawned the usual glut of think-pieces (which we're happily about to add to here) and more than a little bit of finger-pointing and *schadenfreude*, despite the fact that stats on the leaked data seem to suggest that as many as one-in-four of the accounts were held by a single people. Indeed, when we took to the [@iamicro\\_mart](https://twitter.com/iamicro_mart) twitter account to point out that, as far as we were concerned, sharing specific details from this stolen data was no better than sharing private photos online, it became clear that some people felt that we were totally wrong.

Of course, IT-centric publications were less interested in the details of the data as they were in what it told them about such a large sample of users. *The Register* summed up it's findings in its own inimitable style by posing the question "are people really this stupid?" ([tinyurl.com/MMnet77d](http://tinyurl.com/MMnet77d)), and pointing out the sheer number of people signed up to the site using their work, .gov.uk and even .police.uk email addresses – and, either willingly or without their knowledge, shared so much data with the site.

If you thought the Labour party leadership campaign was turning into a bit of a farce, then you need to take a look at the run up to the US presidential elections at the moment. Not only is Donald Trump trolling his way the higher echelons of opinion polls across the land ([tinyurl.com/MMnet77e](http://tinyurl.com/MMnet77e)), it would appear that an internet joke is also in the running ([tinyurl.com/MMnet77f](http://tinyurl.com/MMnet77f)).

A candidate going by the name of Deez Nuts is racking up decent numbers in opinion polls at the moment, currently making him the top independent, much to the enjoyment of

We spend a lot of time bemoaning EULAs and Privacy statements; even if it's just a rant about their length and whether anyone actually bothers to read them. Generally, we have to shamefully admit, we take the pragmatic view that says "well, whatcha gonna do?", have a quick scan and click accept. However, even we sat up and paid attention when rants started to appear in our Twitter feed regarding Spotify's new T&Cs, which appeared to significantly widen the amount of data the application wanted access to - including access to your photos, phone contacts, the phone's microphone and location data. It seemed, as *Wired* put it ([tinyurl.com/MMnet77j](http://tinyurl.com/MMnet77j)), 'Eerie' and a step too far for a music app.

Others agreed, including *Minecraft* creator Markus Persson, who used his [@Notch](https://twitter.com/Notch) Twitter account to announce to 2.4m followers that Spotify was now "confirmed evil", and that he had cancelled his subscription over the changes ([tinyurl.com/MMnet77k](http://tinyurl.com/MMnet77k)). It was a statement that seemed to cement the idea that the streaming service had made a massive mistake, and even elicited a response from the firm's CEO Daniel Ek ([@deldsjal](https://twitter.com/deldsjal)).

Ek also took to the Spotify blog to attempt to illuminate the reasons for the changes ([tinyurl.com/MMnet77l](http://tinyurl.com/MMnet77l)). Indeed, when he explains why certain requests are being made, they seem to make a lot more sense, and seem a lot less... we dunno... Big Brother-ish. His post does, however, prompt the question: 'why didn't they explain that in the first place?' – a point much more elegantly made by *The Verge* in it's piece bemoaning the FUD ([tinyurl.com/MMnet77m](http://tinyurl.com/MMnet77m)) being spread about over the whole sorry affair ([tinyurl.com/MMnet77n](http://tinyurl.com/MMnet77n)).

the internet – because, yes, that name is as fake, and just rude as it sounds. It refers to the well-documented 'Bofa' meme (the NSFW details of which we won't go into here, but which you can read at [tinyurl.com/MMnet77g](http://tinyurl.com/MMnet77g)), so of course the internet responded as only it could: with a supercut of newsreaders saying the name ([tinyurl.com/MMnet77h](http://tinyurl.com/MMnet77h)).

Even more hilarious than that, though, is the reality. According to *Rolling Stone*, Deez Nuts is the *nom de guerre* of a 15-year old lowan by the name of Brady Olsen ([tinyurl.com/MMnet77i](http://tinyurl.com/MMnet77i)), who started the whole venture as a part joke, part statement about the electoral system and the other candidates, but who says he will take it "As far as America wants to take it."

## .AVWhy? Videos For Your Eyes... Not Necessarily For Your Brain

You may think that, by now, we'd have had enough ([tinyurl.com/MMnet77o](http://tinyurl.com/MMnet77o)) of ([tinyurl.com/MMnet77p](http://tinyurl.com/MMnet77p)) Muppet ([tinyurl.com/MMnet77q](http://tinyurl.com/MMnet77q)) and ([tinyurl.com/MMnet77r](http://tinyurl.com/MMnet77r)) *Sesame Street* ([tinyurl.com/MMnet77s](http://tinyurl.com/MMnet77s)) lip sync videos, but you'd be wrong. That's why, we're now going to point you in the direction of Fozzy and Kermit 'performing' NWA's classic *Express Yourself* ([tinyurl.com/MMnet77t](http://tinyurl.com/MMnet77t)); doubly apt this week, considering the current proliferation of the 'Straight Outta X' meme, encouraged by the promo campaign for the group's new biopic ([tinyurl.com/MMnet77u](http://tinyurl.com/MMnet77u)).





## Caption Competition

"Grenville Grimace gives his unbiased review of windows 10"



This angry chap was the subject for our caption competition in issue 1375. He certainly kept you busy..

- **Computer Dave:** "Windows Vista? More like Windows Fista!"
- **Computer Dave:** "Try using face recognition login after this!"
- **JayCeeDee:** "New F.A.S.T. enforcement policy - F.I.S.T.!"
- **Think Tank:** "No you are not rolling back to windows 7."
- **Blacklion1725:** "Warning - do NOT be rude to Cortana"
- **WyliecoyoteUK:** "Hit any key, would you! Pick on someone your own size?"
- **WyliecoyoteUK:** "The new windows 10 update enforcer."
- **Mad Malc Is Back:** "Why 3D laptops never caught on with Skype users..."
- **Thomas Turnbull:** "The virus protection on this system is really in your face."
- **Thomas Turnbull:** "Wow this new internet filter is the business, no chance of loading those iffy pictures accidentally."

The winner, though, with potentially the most esoteric answer possible, was **ricedg** with "Grenville Grimace gives his unbiased review of windows 10", a joke possibly understood by seven people, but which made us laugh – and serves to prove that the Caption Competition is actually run by PlaneMan. If none of that makes any sense, head to the 'Other Stuff' section of our forum ([forum.micromart.co.uk](http://forum.micromart.co.uk)) and say something funny (but not too rude) about the picture below – or email us via [caption@micromart.co.uk](mailto:caption@micromart.co.uk).



# Smach Zero Steam Rollers In

## Portable Steam Machine to give good gaming?

A portable console project formerly known as Steamboy has now become Smach Zero. Yes, this portable Steam Machine will give access to Valve's library of SteamOS games thanks to an AMD G-Series SoC featuring Jaguar-based CPU paired with Radeon graphics.

Alongside that sits 4GB RAM and 32GB internal storage, not

bad for a handheld console featuring a 5" 720p touchscreen, HDMI output, wi-fi, Bluetooth and 4G mobile network connectivity.

If you like the sound of a portable Steam Machine, you can pre-order from November for \$299. Delivery will be in Q4 2016, though, so there's a long time to wait on this. The website to register your interest is [www.smachzero.com](http://www.smachzero.com), however.

# Recharging Scheme On Motorways

## Electric highways trial in the works

Highways England has announced a physical trial of technology that could charge electric cars while on the move, following a study into 'dynamic wireless power transfer' technologies. Should the trial prove a success, electric car owners (lucky people) could be able to charge up their vehicles while driving, at least on motorways

and major A roads equipped with the special technology.

How much will such a wide-reaching system cost? We dread to think, with the process essentially involving electric cables being buried under the road. Besides this, the Highways Agency is also looking to install plug-in charging points every 20 miles on the motorway network, making life easier for electric car owners in the future.



## Snippets!

### **BT's EE Deal Is On**

BT's proposed takeover of EE has been given a boost by Ofcom, as its report to the Competition and Markets Authority (CMA) has found no major regulatory issues with the merger. The CMA will give its final verdict in November, with BT hoping to sign off on the £12.5bn merger by March next year. With Ofcom effectively giving this the green light, expect things to go ahead as planned, barring any disasters.

### **Russia Blocks Reddit**

Russia has taken action against Reddit users who have been promoting a thread on the growth of banned substances. The thread was banned and subsequently blocked by Reddit because of the drugs-related discussion, but reports have noted that the original plan was for the Russian media watchdog to block the entire website if it didn't have a response from Reddit on the matter.

### **Kaspersky Denial**

A Reuters' article that claimed Kaspersky Labs created fake malware in order to damage its rivals' own product ratings has been flatly denied by the company's CEO, Eugene Kaspersky himself.

A blog post on the matter wrote that the allegations were false and, in a mocking tone wrote that "Oh yes. But they forgot to add that we conjure all this up during steamy banya sessions, after parking the bears we ride outside" before then confirming that "The reality is that the Reuters story is a conflation of a number of facts with a generous amount of pure fiction."

There's no getting away from it, despite the humour, Eugene is not happy about this.

# Panda Provides Across-The-Board Security

## **Multi-device range promises protection for all**

**P**anda Security's new range of 2016 Consumer Solutions is now available, providing user protection on all devices. Here's the list (deep breath): Panda Global Protection 2016, Panda Internet Security 2016, Panda Antivirus Pro 2016 and Panda Mobile Security 2016, Panda Gold Security 2016, Panda Antivirus for Mac 2016, Panda Free Antivirus 2016. Phew.

This new range has the usual focus on making your online visits easier and more secure, allowing consumers to browse and shop online safely, protecting families against inappropriate content, plus keeping identities and confidential data safe. Every one of these products offers multi-platform protection across Windows, Android plus antitheft for iOS devices and among the improved features

are Parental Control, application control, recovery of your system and USB protection.

This is all wrapped up in an easier, more intuitive interface in Panda Simplexity and you can find this range over at [www.pandasecurity.com](http://www.pandasecurity.com).



# Nintendo Worker Loses Job After Podcast

## **Criticism doesn't work out well for Treehouse employee**

**C**hris Pranger, formerly a worker within Nintendo's Treehouse division, lost his job as a localisation editor after he appeared on the *Part-Time Gamers* podcast. The reason appears to be that he chose to say various things about the financial ins and outs of the localisation process in gaming. Thing is, sometimes speaking candidly leads to a bad result.

Pranger said on the podcast "They just say the classic, 'Why do you hate money? Why do you hate money, Nintendo?'" speaking of consumers who argue against Nintendo bringing a particular title to their locale. He then, in summary, said that it ultimately isn't always worth it for Nintendo to

bring a certain title to a relatively small group of consumers demanding it.

Somehow, his quotes got out there into Internet land and were obviously picked up by someone at the firm who didn't like what they heard. Pranger himself acknowledged that he had indeed lost his job via a tweet: "As some of you may have heard, yes, I was fired yesterday. Yes, it was ultimately my own fault. No, I did not see this coming."

It's an odd one, really. The quotes that have come out in the media certainly don't sound particularly derogatory to Nintendo and losing your job over something said on a podcast seems harsh.



# Mobile Coverage Checker From Ofcom

## How good is yours?

Good old Ofcom has only gone and created an online mobile coverage checker to let everyone see exactly what kind of coverage we should be getting, as opposed to what we're actually receiving.

The checker – which is found over at [www.ofcom.org.uk/mobile-coverage](http://www.ofcom.org.uk/mobile-coverage) – takes the form of an online map that's based on data provided by mobile operators alongside Ofcom's own testing of signal strength around the

country. The map shows voice and data coverage by operator, coverage inside and outside of buildings, and topographical data allowing you to identify any problematic natural earthly obstructions to coverage.

Thing is, to make this kind of tool the best it can be, Ofcom wants your feedback so it's inviting you to check your coverage experience and leave said feedback. This will then go towards the creation of a new version of the tool expected in autumn. Go on then, off you pop.

# Twitch Plays Dark Souls

## Ambitious crowd-playing gamers try their hand

Can the Twitch collective play *Dark Souls*? A crowd-play attempt by the community been launched... but it's had a bit of a dodgy start.

The experiment essentially works by Twitch users typing in commands into Twitch chat, which in turn are translated into in-game movements and this all seems a far more ambitious attempt at Twitch gaming than previously attempted – with

Pokemon games, for example. However, early footage emerged that showed the controlled character whacking into a wall; again and again. If you want to watch to see if anything's improved, the experiment should still going at [www.twitch.tv/twitchplaysdark](http://www.twitch.tv/twitchplaysdark).



# Samsung's New Smartphone Provides A Bigger Edge

## New super-size model for range

Samsung's latest assault on the mobile space has arrived in the form of the Galaxy S6 edge+, a new 5.7" Quad HD Super AMOLED smartphone building on the S6 edge. The handset has 4GB RAM and is capable of 4K video filming and an advanced camera system with Auto Real-time High Dynamic Range, Smart Optical Image Stabilisation and brand new filters. A button on the phone activates a "live broadcast" mode, streaming 1080p high-def video to YouTube and, of course, the smartphone looks every bit the part that Samsung's latest devices have done for a while now.

In other Samsung news, its Note 5 tablet won't be getting a European release, with the company presumably wanting this new mobile to make good ground. As a result of this announcement, European consumers have been signing a petition calling on the firm to release it over here after all. Will they succeed? Doubt it.



# Man Breaches Court Order By 'Like'ing

## Arrested again over Facebook action



A Pennsylvania man, who was ordered to stay away from a woman for a year, has been arrested for going onto Facebook and hitting 'Like' on bunch of her posts.

The restraining order on Justin Bellanco was ordered in relation to his ex-girlfriend after he had threatened to "shoot her knee cap", and Bellanco breached that order by 'Like'ing on over twenty photos and videos.



## Gigabyte P37X Gaming Laptop

We take a look at a high performance mobile gaming setup

### DETAILS

- Price: ~£1350
- Manufacturer: Gigabyte
- Website: [goo.gl/l87JCa](http://goo.gl/l87JCa)
- Requirements: Microsoft account for Windows 8.1, upgradable to Windows 10

Gaming laptops have come a long way in recent years, there's far more to them these days than a simple boost over the clock speed of other laptops. Indeed, many feature CPU, GPU and memory specifications that would make a decent desktop blush with embarrassment.

The Gigabyte P37X, for example, is a powerful 17.2", full HD 1920 x 1080 IPS LCD laptop with 8GB of DDR3L 1600MHz memory (but which could be boosted to 16GB), an Intel HD4600 GPU and an Nvidia GeForce GTX980M with 8GB of GDDR5 memory. There's also a secondary 1TB hard drive alongside a primary pair of 128GB SSDs setup in RAID 0 with Windows 8.1 pre-installed.

The CPU is an impressive Intel i7-4720HQ running at 2.6GHz, and you'll also find a Blu-ray rewritable drive, 802.11 ac/b/g/n wi-fi, and Bluetooth 4.0. The side positioned ports consist of a pair of USB 2.0 ports, gigabit Ethernet and an SD card reader

▲ The Gigabyte P37X is a great mobile gaming laptop, with an excellent screen

▲ It's actually quite stylish too

on the left-hand side; with HDMI, two USB 3.0 ports, VGA and a mini DisplayPort on the right-hand side. There's also a front-mounted optical drive.

As far as design goes, the Gigabyte P37X isn't too bad considering it's classed as a

gaming laptop, which tend to be on the chunky side. The P37X, on the other hand, manages to deliver all this performance in a chassis that measures just 417 x 287 x 22.5mm and weighs just under 3kg.

The backlit, full-size keyboard is large and well-spaced, making it easy to type with and use on a daily basis. Down the left-hand side of the keyboard you'll find a set of six G-keys for macro setups, and in front there's a large trackpad with a couple of semi-hidden left and right mouse click buttons. Out of the entire setup, the trackpad, we have to

admit, is the probably the worst component. It didn't feel quite as responsive as we'd have liked and the mouse click buttons were a little poor too.

The screen is simply superb, though. The IPS display is bright, responsive and displays an excellent range of colours as well as deep blacks and non-grainy whites; great for gaming, but it's also good for films, imaging and video editing. It's still only 1080p though, which may have some users looking elsewhere, though the DisplayPort or HDMI connections mean you can always hook up a 4K monitor if you're desperate for extra pixels.

In terms of performance, the Gigabyte P37X didn't disappoint. With an overall 3DMark11 score of 11022 there's enough gaming performance for most (if not all) of the current triple-A titles; although it's a little less than the FutureMark recommended spec for the Oculus Rift.

The Gigabyte P37X is a good performer, looks great, and has an excellent screen. It can get a little noisy when the fans kick in, and the trackpad isn't the best we've ever seen, but it's well worth looking into if you're in the market for quality mobile gaming.

**mm David Hayward**

**A great gaming laptop, with a superb IPS display**

### Quick Specs

- Nvidia GeForce GTX 980M GDDR5 8GB
- Super slim & light 17" Extreme Gaming Laptop
- Unique Macro Hub for gamers
- Exclusive Supra-cool technology
- Quad-storage with hot swappable bay
- Full HD IPS display with wide viewing angle
- High Speed 802.11ac wi-fi





# Logitech BCC950 Conference Cam

Our evil robot overlords have dispatched their minion to watch our every move

## DETAILS

- Price: £190 (Ebuyer)
- Manufacturer: Logitech
- Website: [www.logitech.com/en-gb/home](http://www.logitech.com/en-gb/home)
- Requirements: USB 2.0 port, Windows 7, XP, and Mac OS X 10.6 and higher. Microsoft Lync, Skype or other conferencing application

I've reviewed some weird looking stuff in these hallowed pages, but Logitech's BCC950 Conference Cam deserves an award for being one of the wackiest ever. It's how I would imagine the pet that a Dalek comes home to each night would look – and you can make it even odder if you put the spherical camera on the vertical pole that's included in the box. In case you were wondering, it's not telescopic... That would be just too much craziness for this reviewer to handle.

Look past the styling, however, and you'll discover that Logitech has built a very high quality video conferencing module that incorporates a tilt/swivel/zoom camera with a full 1080p sensor. It also features a Carl Zeiss lens with nine-point auto focus, so you should easily



be able to see the beads of sweat on that person in your business conference who gets called out for not completing the tasks they were given.

The direction the camera looks can be adjusted from the base, using a small remote, or even using software. Logitech don't provide any apps, or even drivers, but when attached by USB to a Windows 7 PC these were installed automatically. It works alongside Skype without any real effort, should you have that installed. I didn't test it with all of them, but I'm reliably informed that it also works with Adobe Connect, Avaya, Cisco WebEx and other Cisco Video Conferencing applications, Citrix Go to Meeting, LifeSize Connections, FaceTime, Google Hangouts and Video Chat, Microsoft's Lync and Office365, and Vidyo.

What's well thought out about the BCC950 is that,

other than requiring a host PC, it's entirely self-contained. The base has a speaker and microphone, so in theory you don't require extra accessories to organise a business call with video and sound.

The field of view is 78°, and the Sphere can be rotated through 180° horizontally and 55° vertically, so hopefully nobody needs to be speaking from out of shot.

The only problem I noticed in respect of the coverage is that the microphone doesn't have the level of coverage that the video gets, and in that respect an external microphone jack might have been a good option for who might be sat well back from the base. The sound is also only mono, so if you don't see the person speaking then you've no idea where to point the camera. I've no complaints about is the image quality, though, which is generally

excellent even when the lighting situation isn't perfect.

For home users this device is probably overkill, unless you've close relatives that have moved to some distant part of the globe. However, for a business that wants to reduce the cost of travelling, and have a simple-to-organise facility for conferencing, it's a solid choice.

**mm Mark Pickavance**

***A strange looking but effective conferencing tool***





# Vodafone Smart Ultra 6

Vodafone's branded Smart Ultra 6 confounds Mark's expectations



## DETAILS

- Price: £125 PAYG
- Manufacturer: Vodafone
- Website: [www.shop.vodafone.co.uk](http://www.shop.vodafone.co.uk)
- Requirements: Vodafone SIM

**W**hen you buy a budget phone, and a branded one at that, you can expect a device that works but which doesn't offer much in the way of signature features. Or, at least, that's the way it used to work.

Vodafone's own-brand Smart Ultra 6 costs £125 on a Pay-As-You-Go or it's free on a £17 monthly contract. However, for that modest price you get a massive 5.5" 1080p display, an Octa-core 1.7GHz Qualcomm Snapdragon 615 processor, 2GB of RAM, 16GB of storage (11.5GB free), a 13 megapixel camera, 4G service and Android 5.0.2. My immediate reaction was: 'so what's the catch here?'

The more I look at this device, though, the more I've come to the conclusion is that there isn't really one to fine. That processor, for example really cranks along, and is much quicker than anything



I've seen in the sub £200 bracket before. That 2GB of RAM certainly helps, and helps provide one of the most stable Lollipop experiences yet.

However, previous Vodafone Smart devices have usually been let down by both the screen and the camera, something not uncommon in budget phones. The screen here isn't as good as you might expect in a full

price Smartphone, though it's sharp, bright and very clear. For whatever reason the blue channel seems a bit weak, which mildly mutes the chromatic range. That said, we're talking a nuanced limitation that five years ago would have bettered any display on a phone from any maker out there.

By comparison, the camera is – for most uses – a revelation, especially when used for outdoor photography. In low light conditions the results can be grainy, but that's more about how much light the tiny 5mm lens can let in rather than the quality of the sensor behind it. You can get great pictures from this phone, if you're prepared to understand it's strengths and play to them somewhat.

So where could this design

be better? There were a couple of things that really annoyed me to do with the way that Android had been implemented on the Ultra 6. This phone has the three button model below the display, though here they're not visible until they're backlit in blue. Except often when they are active they're not backlit, and you have to guess where on the black display they actually are.

That's irritating, and my other gripe is to do with the launcher. One of those where if you go left from the start screen you get Flipboard. I don't want that app there, I like the screens to include my gadgets, not apps I don't use. That's fixable with an alternative launcher, but what I don't need is phone makers deciding how I'll be using a device before I've even bought it.

## Vodafone Smart Ultra 6 specifications

**Processor:** Qualcomm Snapdragon 615 MSM8939, octa-core

**Display:** 5.5" Full HD (1080 x 1920)

**Storage:** 16GB, microSD (up to 128GB)

**Memory:** 2GB of RAM

**Camera:** 13MP rear-facing LED flash, 5MP front-facing

**Operating system:** Android 5.0.2, Lollipop

**Battery:** 3000mAh

**Dimensions:** 154 x 77 x 8.35mm

**Weight:** 159g





As you might expect, Vodafone also unleashed its minions of cross-selling on the poor Ultra 6, and blighted it with a host of branded apps that most users won't want. Thankfully you can actually ditch most of them, freeing up a little bit of extra storage space should you need it.

There is, however, a MicroSD card slot, so you can add more storage if you find the 11.5GB of user-available capacity if it is insufficient. Battery life is also half decent, with the 3,000 mAh capacity keeping the Smart Ultra 6 going through even heavy use days without the need for a power pit stop.



Where this phone is a little disappointing is in the build quality, though if it was better made I'd be constructing a conspiracy theory about why. The grey plastic back feels cheap and likely to show marks pretty quickly. The front is more pleasing, if a rather blatant homage to the older iPhone models.

Nevertheless, this phone represents remarkable value for money. With the possible exception of NFC, it's got just about everything you might reasonably want in a modern Android Smartphone. The size might put some people off, but I suspect that some older customers might really like the scale and clarity of the 5.5" screen for reading messages and browsing web pages.

This is the very first Vodafone branded Smart series phone

that I've actually resented returning, and that strongly hints to me that the future of these devices won't be exclusively driven by a small select group of brands. If you like Vodafone, and you need a cheap replacement phone, this is certainly the one to get.

**mm Mark Pickavance**

***A remarkably full featured PAYG phone from Vodafone***





# Brother DS-920DW

Have scanner, will travel... and scan, probably

## DETAILS

- Price: £204
- Manufacturer: Brother
- Website: [www.brother.co.uk](http://www.brother.co.uk)
- Requirements: Either Windows XP or Mac OS X.7 and later

The Brother DS-920DW is a scanner that offers double-sided document scanning and its own wireless network functionality hence the 'DW' part of its model number. Unlike more familiar flatbed scanners that reside on desktops, either as standalone devices or part of a multi-function product, the DS-920DW is a page scanner that has been designed to be portable for those whose workplace is on the move.

This kerbstone-shaped scanner, white in colour, can be powered direct from a computer or the mains using a supplied micro-to-standard USB lead, or from a replaceable Li-ion battery pack. The battery slots into a compartment located on the right side of the scanner, where you will also find a switch to turn off the unit's wi-fi feature. The USB lead is used to charge the battery pack from a connection on the left side of the scanner.

To be scanned, documents need to be fed into an opening at the front of the unit. This opening features a paper guide



which can be adjusted to the paper size markings, which vary from business card up to A4. The scanned document is then ejected from the rear of the unit. It would have been beneficial if there had been a support arm to help keep the documents under control and stop them being scattered around, though.

Conveniently positioned at the top right of the scanner – at least for those of us who are right handed – is the unit's control panel. A 2cm LCD monochrome screen provides status and settings feedback. Arranged below the screen are buttons to toggle between colour and monochrome, single and double sided scanning, plus a choice of PDF or JPG formats. There are also buttons for power, selection, and menu options plus a wi-fi LED to indicate wi-fi activity.

Although the DS-920DW does not have any built-in capacity for storing its scans, it does feature an SD card slot, which can be

used for this function. Brother has included a 4GB SDHC card in the package for your initial needs; any replacement card will need to be formatted using one of the options available from the Menu.

When scanning documents the DS-920DW gives you a choice of modes. As mentioned, documents can be scanned and stored on an SD card. You can also connect this scanner to a computer and use software provided on a DVD to send scans to a hard drive or direct to an application such as an email client, printer or FTP server. Plus there is the scanner's wireless network capability, which will need to be turned off when using the unit with a computer.

The DS-920DW can become the hub for a wireless network to which you can connect devices such as a laptop, tablet or smartphone using standard conventions. Using the browser on the connected device you will be able to log into the scanner's website – protected by a user name and password – in order to access the scans stored on the SD card. You can also use this website to make adjustments to various settings and set up a BOL (Brother Online) account, which offers a mixture of free and paid services including Cloud storage.

**mm Michael Fereday**

**A useful scanning tool for the road warrior**



## Brother DS-920DW Portable Scanner

Wireless	802.11 b/g/n
Energy Consumption	2.5 watts in operation
Scan resolution	1200 x 1200 dpi optical
A4 scan	10 seconds
Dimensions	308 x 67 x 42mm (W x D x H)
Weight	530g



# Xenta Laser Wireless

Xenta tries to create the perfect laptop mouse

## DETAILS

- Price: £15 (Ebuyer)
- Manufacturer: Xenta
- Website: [tinyurl.com/q4jmp7a](http://tinyurl.com/q4jmp7a)
- Requirements: Windows XP/Vista/7/8/10. Management Software



Experience tells me that the phrase 'ergonomic mouse' has been horribly abused over the past three decades. Not least because hand size and shape can vary so wildly, that what's perfect for one person is much less so for another. The Xenta Laser Wireless Mouse tries to address that issue in an interesting way: while providing the sort of ideal wireless device for laptop users.

The overall shape is reminiscent of the Microsoft Arc designs, but the Xenta shape doesn't fold in the middle. Because of that it's actually more comfortable to use, and offers more support to the hand.

To use it from the box you simply open a small battery cover, remove the tiny USB dongle and insert a single AA battery which Xenta provides. With the dongle in a USB port and the power button switched to 'On' you should be moving the pointer in a

matter of seconds. This isn't a complicated layout, with just four ordinary buttons and the usual single button roller that's become so popular.

For the extra comfort of the user Xenta provides four rubber inserts that you can use down either side, labelled A, B, C & D. Curiously only D fits on the left side, with A, B and C all being alternative sculpted shapes for the right hand side.

some adhesive tape and attach it more permanently.

More customisation options come with the DPI control, which enables the mouse use one of four DPI's ranging in 400 DPI jumps from 800 to 2000. To change up the DPI you hold the left and right buttons down for three seconds, and it will cycle to the next setting before coming back to 800 DPI.

“ This is a decent design that could find favour with the many ”

That made me wonder why they didn't just attach 'D' for you, as there isn't any other choice on the left?

Whatever the logic is, once you've used the mouse for a while and decided which shape you like you can peel off

The only complaint I have about this is that the difference between 800 and 1200 DPI seems large in sensitivity terms, and also there is no LED feedback as to where you are in the scale. I guess most users will set it and forget it, unless they accidentally move it.

The strongest points in this design, at least for this reviewer, are the power management features. These enable you to turn off your machine without worrying about the mouse; it will enter standby automatically if it can't see the 2.4GHz dongle.

That means you're much less likely to get the mouse out of your laptop bag and find the battery is flat, and you'll be buying less batteries hopefully.

The obvious weakness is the switch mechanisms put under the main two buttons, which are just too noisy for anyone like me who prefers the subtle click. Despite that fault this is a decent design that could find favour with the many who don't care for touch screens or touch pads.

**mm Mark Pickavance**

**A small and power efficient wireless mouse for laptop users**

## Technical Specifications

- DPI: 800 -1200 -1600 -2000
- 1x AA Battery
- 2.4GHz Wireless
- Laser Sensor
- Side Keys for backwards/forwards
- Internal nano receiver
- Power saving technology – automatic standby mode
- Dimensions: 112 x 58 x 31 (mm)





# Cast Of The Seven Godsend

Back to basics with an 80s/90s inspired side-scroller

## DETAILS

- Price: £5
- Manufacturer: Raven Travel Studios
- Website: [goo.gl/vlN4hL](http://goo.gl/vlN4hL)
- Requirements: Windows 7, Mac OS X 10.7, 1GB RAM, any DX10 GPU



**C**ast of the Seven Godsend from indie developer Raven Travel Studios is a classic 2D scrolling, run-and-gun flavour game. Images of *Ghosts 'n Goblins*, *Rygar*, *Metal Slug* and a host of 8-bit favourites (*Cobra* and *Exolon*, for example) spring to mind as you begin the first level fighting your way ever toward the right of the screen.

The story behind *Cast Of The Seven Godsend* mimics a dark Brothers Grimm-like tale of a stolen child prince, and the meddling of ancient gods. The game begins with a cut scene of a husband and wife admiring their new born son. A mage appears and takes the child, with the father being killed in the process of trying to stop him. The child is then magically transported to another realm where it becomes the key to unchaining the magical bonds that bind a terrible and powerful evil.

The Gods, in their divine wisdom, decide to resurrect the slain father and imbue him with supernatural powers. His task is simple enough: fight through the six worlds, find the seven god-like sets of armour, rescue his son and defeat the ultimate evil once and for all. It's fun, for the most part, and the combination of easy directional controls, with just two buttons for fire and jump, and interesting 16-bit graphics make this pleasant change from

the overcomplicated works of art we see in the Steam catalogue of games. However, after about fifteen minutes of play you soon begin to see the cracks, flaws and lack of polish.

While there's plenty to collect within each level, along with masses of respawning enemies à la *Ghosts 'n Goblins*, together with platforms to jump up to that take you away from the left to right scrolling theme for hidden treasures, the game soon become extremely monotonous.

The graphics will lose their 16-bit appeal and instead frustrate you as poor collision detection rears its ugly head. Jumping from one platform to another can be a hit and miss affair, and there's the overriding feeling that you're never really sure what it is you're supposed to be doing.

The soundtrack drones on enough to make you mute your speakers, and the rather badly translated script does at times come up with some odd

comments from the characters you'll inevitably meet.

*Cast Of The Seven Godsend* has its problems, that much is evident yet, for all its issues, it can be a decent bit of fun for a quick half-hours worth of play. We can't see it lasting more than an hour or two at most, and there's little to make you want to come back for more.

While it's great having a retro 16-bit scrolling game back on the shelves of Steam there are better examples – the aforementioned *Metal Slug* for example, or *Aero's Quest: Apotheon*. This game's in much need of being re-worked, perhaps tidying up the scripts, elements of the graphics and providing the player with a better idea of how to activate the various combat spells at your disposal would be a good idea earlier in the game. Instead, you've lost interest before the game begins to warm up.

For £5 it can be considered cheap enough to give a go, but considering you'll only likely get an hour or so of play out of it there's little other incentive to. *Cast Of The Seven Godsend* is okay, but it could do with a few of the creases ironing out.

**mm David Hayward**

**Reasonable fun, but lacking the qualities needed to keep you coming back for more**





# Onikira: Demon Killer

We enter feudal Japan for a spot of demon bashing

## DETAILS

- Price: £7
- Manufacturer: Digital Furnace Games
- Website: [goo.gl/UJ9Fz8](http://goo.gl/UJ9Fz8)
- Requirements: Windows Vista+, 1.8GHz core 2+, 2GB RAM+, Nvidia 8800 GT/HD3650+

There's something about a side scrolling 2D beat 'em up that takes you back to a more simple time in gaming. To make a decent 2D scroller, though, you need a concept that will grab the attention of the gamer. It needs to have a story that you actually care about, it needs to be fast and energetic enough to be competitive but not impossible and it needs a certain sense of style to lure in those playing.

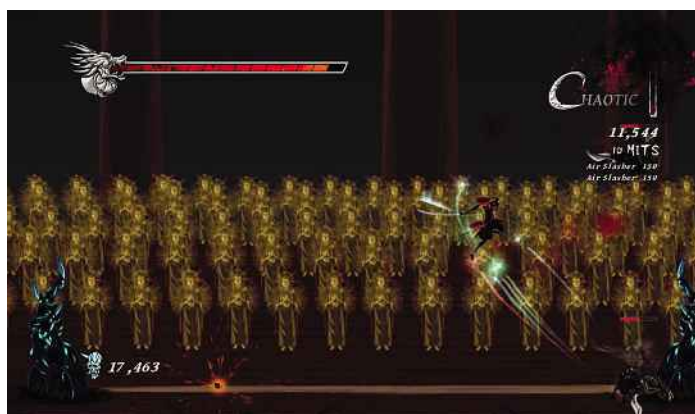
*Onikira: Demon Killer* ticks off every item on that list. The game has you as a lone samurai warrior, fighting his way through feudal Japan in order to stop evil forces from entering our world. There's more of a back story involved, with an ancient enemy absorbing the spirit of a dragon and becoming near unstoppable, but for the sake of space we'll let you dig deeper in the eastern legend that this game follows.

Essentially *Onikira: Demon Killer* is a classic 2D scroller through and through. You move to the right from the left, occasionally stopping to take out a group of evil demons that arrive via a portal from the underworld. Think *Streets Of Rage*, but with demons and flashing samurai swords.

You have various attack abilities at your disposal, and by mashing a variety of keys



▲ You have a number of blade wielding moves to perform on the spawn of the underworld



▲ As you battle through the levels, you'll get better weapons and learn even more devastating combos

you'll soon get to grips with scooping up the enemies, and dicing them up while in mid-air. Eventually you'll have a number of combos at your command and can apply them to devastating effect, sweeping up handfuls of demon types and sending back to whence they came. However, the game in its current state assumes you're using a controller so be prepared for a spot of remapping for keyboard and mouse use.

Accompanying you through the levels is a heavy soundtrack that adds to the fast paced slice-n-dice action as you perform unbelievable manoeuvres on increasingly difficult foes.

Health regeneration is non-existent in the first level, but after defeating a giant undead samurai, with an eyeball in his stomach, you eventually gain the power to consume health from the enemies you kill; giving you a far better chance of survival.

Visually, the game is stunning. The character animations are wonderful, and look very impressive indeed. Equally the backdrops, and the walkways in which you'll dart and leap across vary somewhat leading you to a slightly different path and the odd secret power boost and so on, are just as well drawn; full credit to the visual artistry here,

the ancient Japanese themed legendary samurai look is perfectly pitched.

There are a couple of issues with the game at present. With this being a Steam Early Access build there are some bugs, most notable being a tendency to suddenly switch back to the desktop mid-game. This can be quite frequent, and as a result extremely annoying. Thankfully the game auto-pauses and a quick switch back followed by clicking resume will bring you back to the action. Another bug we've encountered manifests itself as the occasional enemy who gets stuck to one end of the screen and refuses to die, stopping you from progressing. We did find that by scooping him up and dealing him a little more damage (despite him already being dead) did cause him to vanish, allowing you to continue. These are minor annoyances, and we're sure they'll be fixed by the time the game is released proper.

*Onikira: Demon Killer* is a decent indie title, and one we really enjoyed playing. It looks great, plays well and has that often sought-after element: it makes you want to come back for more.

**mm David Hayward**

**A beautifully presented 2D scrolling beat 'em up, fast-paced and well-pitched**





# EVGA GeForce GTX950 FTW 2GB

A new mid-range graphics card that's excels at pretty much everything

## DETAILS

- Price: £144
- Manufacturer: EVGA
- Website: [goo.gl/TnquE0](http://goo.gl/TnquE0)
- Requirements: 350w+ PSU, PCIe slot, 8-pin PCIe power connector, Windows XP+

The GTX950 mid-range graphics card has now been released, amid much anticipation over the last few weeks; including a leak of the specs a day or two before the actual launch of the card. This is a card that's designed to be value for money, without sacrificing performance, especially when it comes to 1080p gaming.

The EVGA braded GeForce GTX950 FTW (For The Win) full-sized card is designed for the everyday gamer who wants a little more from their mid-range GPU. The GM206, Maxwell powered GPU has a base clock speed of 1203MHz with a boost up to 1405MHz, both of which are 17% and 18% respectively above the reference 950, and a memory clock of 6610MHz. You'll find 768 CUDA cores, 2GB of GDDR5 memory with a bandwidth of 105.76GB/s, and a dual BIOS to allow you

## Specs

**Base Clock:** 1203 MHz  
**Boost Clock:** 1405 MHz  
**Memory Clock:** 6610 MHz Effective  
**CUDA Cores:** 768  
**Bus Type:** PCI-E 3.0  
**Memory Detail:** 2048MB GDDR5  
**Memory Bit Width:** 128 Bit  
**Memory Speed:** 0.28ns  
**Memory Bandwidth:** 105.76 GB/s



▲ The EVGA GTX950 FTW has excellent cooling for finely tweaked setups



▲ It's an excellent card, and one that will benefit any systems it's installed in

to switch between differently tweaked profiles. Connectivity consists of DVI, HDMI and three DisplayPort connections, giving you a maximum of four supported displays with a maximum digital output resolution of 1096 x 2160.

Special attention has been paid to the cooling and heat dispersion of the EVGA GTX950. It uses three 8mm SHP (Straight Heat Pipes) for cooling across the main GPU and memory chips, as opposed to the usual U-shaped heat pipes normally associated with many cards. In theory, this should lead to a more efficient method of cooling – up to 6% better cooling according to the specifications provided. n top of the large heatsink, EVGA has used its ACX 2.0 cooling solution,

which consists of a pair of 90mm fans with optimised swept blades, double ball bearings and low power three-phase, six-slot motor. The end result is a much lower use of power to drive the fans, a lower fan weight and improvements to the amount of air that can get to the GPU and the surrounding components. As a brief test of this, we ran the fans at the maximum speed, around 3450RPM, and recorded an idle GPU temperature of just 21°C.

There's a lot to like about here. When fitted to a Gigabyte Z97M-DS3H, with an Intel i7-4790K at 4GHz, 256GB SSD with Windows 10 installed, and 16GB of memory, we clocked a 3DMark 11 score of 8732, which is one of the best we've



seen from a mid-range card – and only four thousand shy of a 4GB GTX970. During that test, the GPU temperature topped at around 64°C with an average fan speed of just 800RPM.

Overclocking on the EVGA GTX950 is handed by its Precision X software, which presents a busy dashboard where you can alter the voltage, GPU clock offset, memory clock offset, fan speeds, GPU temperature target and power target across ten different profiles. With this latest version of Precision X you're able to tweak the card's settings to quite an accurate degree of control, and monitor the results.

The EVGA GeForce GTX950 FTW is a superb mid-range graphics card; excellently designed, pitched at the right level of gamer and enthusiast, and perfectly tweaked for the modern system. The pricing's good too: at £145 it's an affordable and worthy upgrade to consider. **mm David Hayward**

**An excellently priced and mid-range graphics card, ideal for gaming and enthusiast systems**





## Surveillance Kits

### iON The Home

#### DETAILS

- Price: £130
- Manufacturer: iON
- Website: [goo.gl/JTyn5z](http://goo.gl/JTyn5z)
- Requirements: Android 4.0+, iOS 6.0+

Surveillance kits needn't be over-complex 80s style CCTV setups, with a confusing profusion of wires and mounting kits. Indeed, these days, the modern surveillance station is as simple as setting up a webcam. Ion has spent a lot of time in the camera and surveillance industry, and as a result it knows how to present an easy to use kit for the home. The pinnacle of this knowledge is the The Home, a very simple, and affordable wireless monitoring and security device that's ideal for use in the home or at work.

It's available in either black or white, and comes with a decent list of specifications. The small glass 1MP lens has a 102° angle field of view, with a video resolution of 1280 x 720 and ten infrared LEDs arranged for night vision capabilities. As well as night vision, The Home features motion and sound detection as well as a tamper alert. The Home also has built-in 802.11n wi-fi, a tiny 1W speaker and a built-in microphone; it's compact too, measuring just 86 x 95 x 46mm and weighing around 169g.

It works through the use of the connected app, available for both Android and iOS devices, and can be up and ready to use in as little as six steps. In addition to that, The Home also comes with a free cloud service plan, that allows you to view footage from the past twenty four hours. Further plans can be purchased for seven days at a cost of £10 per



▲ The iON The Home, is a really good and capable home surveillance camera



▲ The feed is good, as are the features and setup

month, or thirty days at a cost of £30 per month.

The design of The Home is good for most uses. The tough plastic case is surprisingly rugged enough to take a few knocks, and it's heavy enough to have positioned without fear of it toppling over due to environmental concerns, i.e. being next to a window and getting blown over, for example.

The camera itself is slightly reminiscent of an older Logitech webcam setup, where it's positioned in a puck-shaped head that's attached to the body by an arm and hinged to allow the camera to be folded flat, in a clam shell design. The base is sturdy, and the bottom has the necessary mounting slots for attaching to a wall, or underside of a cabinet.

The feed from The Home is very good, although it's only 720p it's more than enough for a clear view of the area it's setup in. The live streaming works well and, thanks to the built-in microphone and speakers, you're

able to communicate with whoever is on the other end too. With the controls for the camera setup via the iON app, you're also able to control the rotation of the camera lens, so you can have it mounted upside down if necessary, connect multiple camera and control/view them from within the same app, and you can turn off the front LEDs.

The iON The Home is a good little setup, and ideal for keeping an eye on property, pets or a workstation. It's a little expensive, but what you get is a solid package that works well and is easy to use.



# GROUP TEST

## Surveillance Kits

CCTV has come a long way in a relatively short time. Where just a few years ago the thought of a home surveillance kit was considered somewhat extreme, these days you can buy a setup from the likes of Maplin or Currys.

David Hayward takes six kits and their cameras to see what's worth keeping a watchful eye on, and what you should avoid



# Swann DVR4-1500 DVR 4 Channel Kit With 2 Cameras

## DETAILS

- Price: £200
- Manufacturer: Swann
- Website: [goo.gl/1Ylu6j](http://goo.gl/1Ylu6j)
- Requirements: Screen to output to, network already present, any browser to attach and view footage from

**S**wann Advanced Security has been in the surveillance business since 1987, and is a highly regarded, worldwide company that offers security solutions for both the home and business user. Although the vast majority of the company's line focuses on business applications, the home user does get to enjoy some of the handed-down technology from the sector. The Swann DVR4-1500 DVR 4 Channel Kit is one such example. It may seem a little extreme for the home at first glance, but dig deeper and you'll find quite a comprehensive system here.

The kit consists of a compact four-channel digital video recorder, a pair of 700TVL line Pro-735 cameras, two eighteen metre BNC cables, a BNC to RCA cable, an Ethernet patch lead, USB mouse, mounting screws and a set of deterrent stickers.

Starting with the digital video recorder, this is a fairly stylish and compact black box that wouldn't out of place under the TV. The rear features four BNC channel connectors with a further BNC video out, VGA port, RCA audio ports, 100Mb/s Ethernet port and a pair of USB ports. Internally the recorder comes with a 500GB hard drive pre-installed, with the option to upgrade to a maximum of 4TB if necessary.



▲ The Swann DVR4-1500 kit has been handed down to the home user from previous business requirements



▲ It's an average quality kit, though

“ There were frequent moments when the cameras seemed to lag ”

The Pro-735 camera have a maximum resolution of 1280 x 720 provided by a 3.6mm lens. They're both weatherproof, rated to IP67 standard, and are made from aluminium with plastic sections throughout. The horizontal viewing angle is 59°, vertical angle 43° and both lenses have night vision capabilities up to a distance of around 25 metres.

Setting up the cameras and the DVR is a little more complex than the previous

example we looked at, however all that's needed to is plant the positioning of the cameras and to make sure that its BNC is within the 18-metre range of each unit to the DVR.

Once everything is hooked up, you're able to pick up both feeds via the connected DVR and can start recording as needed. With 500GB there's generally enough space for a months' worth of recording, of which you can then back up to a handy USB drive.

We did come across a few issues with the system, however. The first was the rather poor video feed from both cameras. Although the image was 720p, it didn't have the same quality as the previous 720p camera – and it was extremely grainy. For example, we couldn't clearly discern a license plate on the feed, even though it was just a few metres away from the camera, which calls the whole idea of having the cameras in question. The night vision too wasn't quite up to the same standard as the previous example; although the iON The Home is, by comparison to this kit, a simplistic solution, it did offer far better viewing quality.

There were also frequent moments when the cameras seemed to lag, and even some times when they froze altogether and we had to reset the power on both the cameras and DVR before we could get a video feed back again. We also had trouble getting the view to the smartphone app, to the point where we eventually gave up.

While the Swann DVR4-1500 kit may look professional, it certainly had its share of issues. At £200 it's difficult to recommend this to the home user, though, or even a business.





## Surveillance Kits

# TRENDnet 4-Channel HD PoE NVR Kit

### DETAILS

- Price: £350
- Manufacturer: TRENDnet
- Website: [goo.gl/Ha8noY](http://goo.gl/Ha8noY)
- Requirements: Screen to output to, network already present, any browser to attach and view footage from

**W**e recently had the pleasure of testing the TRENDnet 4-Channel HD PoE NVR Kit for its own review, however, since we were planning a group on surveillance kits we thought it would be interesting to see how well it fared when stood side by side with the competition.

The TRENDnet 4-Channel HD PoE NVR kit consists of a pair of TV-IP320PI 720p outdoor cameras, a TV-NVR104 network video recorder with a pre-installed 1TB hard drive, two thirty metre Ethernet cables, a 1.8m Ethernet patch lead, a 1.8m HDMI cable, an optical mouse, power adapter, a collection of installation guides and a CD with the user guide on it.

Starting with the network video recorder, the TV-NVR104's 1TB hard drive is capable of recording at least a couple months' worth of HD footage to it, or at least eight and a half days' continuous recording from four separate cameras. At the rear it has four Power-over-Ethernet (PoE) ports, two of which will be used by the included cameras and two left spare for further upgrade to a four-camera setup. There's a 100Mb/s network port for connecting to a LAN, a pair of USB 2.0 ports, HDMI, VGA, and a pair of analogue audio ports.



▲ The provided pair of cameras are of excellent quality



▲ The network video recorder can use a further two TRENDnet cameras

## “ Using Power over Ethernet is a great advantage with the TRENDnet kit ”

From here, once everything is connected, you'll be able to view the feed from the cameras in a split screen arrangement, or view any of the previous recordings located on the hard drive.

In terms of the cameras, the lens of each has a focal length

of 4mm with a progressive scan CMOS sensor. The horizontal viewing angle is 70°, vertical 52° and at the diagonal, 89°. Each camera has 720p HD recording capabilities, and a tough weather resistant housing rated to IP66. There's

a 100Mb/s PoE port, which is one of the main draws of this setup over most conventional wired setups, and the kit comes complete with the necessary mounting kits.

The setup of the cameras and the network video recorder is fairly easy. As with the previous group entry, you'll need to plan your positioning accordingly and make sure that you don't over extend the Ethernet ports. With Ethernet you have a limit of around 100 metres, the latter BNC connection on the Swann setup can, in theory at least, extend to twice that before you lose the signal.

Using Power over Ethernet is a great advantage with the TRENDnet kit, though. While it would be a more modern approach to use wi-fi, you'll get a faster communication between the cameras and the NVR via Ethernet.

On the whole this is a very good system. It's fast enough, delivers a clear image, and has enough features for both the home and business user. Sadly, though, it's also the most expensive kit we've tested so far. At around £350, you'll certainly need to be committed enough to buy and set this kit up.

If you're committed to getting the best results, though, this is a surveillance kit worth seriously considering.





# Belkin NetCam HD WiFi With Night Vision

## DETAILS

- Price: £130
- Manufacturer: Belkin
- Website: [goo.gl/pWeKTI](http://goo.gl/pWeKTI)
- Requirements: Android 2.2+, iOS 4.2+, any wi-fi router

This entry moves away from the business-like setups featuring cameras and digital recording devices, and is more of a direct competitor to our first entry, the iON The Home.

The Belkin NetCam HD WiFi Camera has a 3mm lens with a 2MP image sensor and a 1/3" CMOS sensor capable of resolutions of up to 1280 x 720. The horizontal viewing angle is 78°, vertical is 45° and you get a very good 90° diagonal view as well. The night vision element comes courtesy of eight infrared LEDs, and is surprisingly clear even in extreme low-light levels. Indeed, it's the best night vision lens we've tested so far.

As the name suggests, this is a wi-fi model with 802.11 b/g/n capabilities and the ability to view the feed from the camera via the NetCam app, which is available for both Android and iOS devices. Interestingly you can also use the WeMo home automation app, to not only view the video feed from the camera, but also set up certain situation-specific triggers.

The NetCam is finished in all-white plastic. Another puck-like device that sits on a leg attached to a wider base; it has a simple, webcam-like look although it doesn't feel quite as sturdy or as well constructed as its competitor from iON.

Setting everything up is a simple enough affair, you just download the NetCam app,

attach to the camera's wi-fi signal and follow the app's on-screen instructions. Once setup the image is rather good, and reasonably clear. There were a few instances where movement slightly quicker than a walk causes lag and ghosting, though, and the night vision mode did seem to glitch out on more than one occasion.

You can setup email alerts when movement is detected,

and recording can be handled through the Cloud+ service that will keep your footage for a minimum of fourteen days for as little as £10 per month.

The Belkin NetCam HD WiFi camera is a reasonably good home surveillance setup. It's easy to get working, and to use, and it can perform well providing the circumstances are just right. Plus, there's the interaction with home



▲ The Belkin NetCam HD is a reasonably good home surveillance camera

◀ Overall though, the quality didn't feel quite up to standard

automation products and apps, which is a little more alluring than most other kits. However, we thought the overall quality was lacking somewhat. The video feed and streaming didn't feel quite up to the same level as the iON device, and the camera felt a little flimsy too.

For £130, the same cost as iON's device, we would have expected a little more. As we said, though, the home automation element may attract more users that just its home surveillance applications.





## Surveillance Kits

### Fusion Curve IP Cam

#### DETAILS

- Price: Up to £35
- Manufacturer: Fusion/Shenzhen XQ Security
- Website: [goo.gl/Yorc2S](http://goo.gl/Yorc2S)
- Requirements: Android 2.2+, iOS 4.2+, Windows XP+, any modern browser

**T**he long list of Fusion camera products is the result of cheap Chinese cameras flooding the market, and appearing on a number of sites – starting off on eBay.

As with most of the general, generic Chinese imports you take a certain risk by buying into the product. There's a chance that the device that's delivered to you won't be the one you ordered, or that it'll fail to work, but sometimes you get a really good deal.

We approached the Fusion Curve IP Cam with a certain sense of caution then, as you would expect. The 2.8mm 1.3MP lens offers a display resolution of 1280 x 720, with a wide angle view of up to 105°. There's a surprisingly capable night vision feature thanks to the eleven infrared LEDs, which offer a good view in extremely low-light situations up to a distance of around eight metres.

Naturally, as the name suggests, this is a wi-fi camera with 802.11 b/g/n support. You also get a two-way audio function in the form of a built-in microphone and speaker, as well as email alerts for motion detection, sound detection and any tampering. Furthermore, the Curve IP has a micro SD card slot with support for cards up to 32GB in size.



▲ *The Fusion Curve has some good specs, but it's a poor quality product*



▲ *It's cheap, yes, but it's not all that good*

The camera itself is incredibly easy to setup, much in the same way as the previously reviewed iON and Belkin devices. To view the footage you have to use an app called P2PWifiCam, which was developed alongside the Chinese import cameras built in the same vein as the Curve IP Cam. Although the app is

functional enough, it does have the annoying tendency to suddenly freeze or to revert back to Chinese for the menus. Restarting the app will fix most issues, though – until we learn Chinese and can fix it without having to wipe it from the task manager.

The build quality of the Curve is pretty dire, though.

The casing is made from a cheap, almost 3D print-feel plastic that's very flimsy and shifts as you handle it. Don't expect this to last long if you're in an environment where it could be knocked around a bit.

The video feed from the Fusion Curve IP Cam isn't the best we've seen in the tests so far, either. While we agree that the low-light and night vision capabilities of the Curve are very good, the normal everyday viewing and streaming is ironically rather poor. There are frequent moments of lag, lots of ghosting and a grainy feel to the quality of the video and stills.

The streaming is particularly bad. On the same network as the camera and within a few feet of it, there are a few issues. However, once you remove yourself from the range of the network, even on 4G, the stream is incredibly choppy. This may well be the fault of the app rather than the hardware in the camera, but it's worth mentioning.

Unsurprisingly, the Fusion Curve IP Cam is pretty cheap. You can pick one up from anywhere between £25 and £35 depending on where you shop. Whether it's worth that amount is up to you, but for quality use over time, we'd recommend you spend more and opt for the other setups we've reviewed in the group.





# Nest Cam

## DETAILS

- Price: £159
- Manufacturer: Nest
- Website: [goo.gl/DBEZez](http://goo.gl/DBEZez)
- Requirements: Android 4+, iOS 8+, Nest Account, wi-fi

The Nest Cam originally started life a couple of years ago as the DropCam Pro. Since then, though, DropCam has been bought out by Nest and what followed was a quick re-design, and the introduction of a new app to control it with. The result seems to have been successful, according to many home security pundits, so we were looking forward to giving the Nest Cam a try.

The Nest Cam is the only camera in this group to hit the magical 1920 x 1080 resolution thanks to the 3MP, 1/3" sensor. The viewing angle too is good with an exceptionally large 130° diagonal, and you'll find eight high powered infrared LEDs with a special filter for a much improved night and low-light viewing.

In addition to the above, the Nest Cam has a dual band wireless setup, with 802.11 a/b/g/n at 2.4GHz and 5GHz, as well as Bluetooth Low Energy connectivity. There's also a two-way audio setup from the built-in microphone and speaker, and you get motion and sound detection, including face recognition, as well as tamper detection.

There is an alert function within the setup, however it's only set for thirty minute intervals. So if someone was to walk into the room you're monitoring just after the thirty minute alert sounded, they could be rifling through your undergarments



▲ The Nest Cam has a brilliant 1080p camera feed

for a good twenty five minutes before the camera would alert you again. The motion detection, though, would be active during that time – it's just it would be nice to catch the culprit red-handed, as it were.

Setting up the camera with the Nest app is a simple six-step procedure, much the same as the previously reviewed wi-fi cameras from the group. Once it's paired and you're viewing the feed the first and most obvious feature is the increased resolution and quality of the footage. Needless to say, it's the best we've seen on all of the setups so far.

The streaming of both the video footage and any accompanying audio was quite good. Within the same network the 1080p stream was near-perfect, outside of it and on 4G

it was good, but it did falter from time to time. The 720p feed though was much better, on a par with the first camera from iON.

Recorded footage can be accessed up to thirty days later via the Nest Aware secure cloud service. Thirty days of video will cost £24 per month, with £12 for each additional camera added to the same home. Alternatively you can opt for just ten days of recording for £8 per month, with an additional £4 per extra camera added. It's certainly not the cheapest solution we've seen.

The Nest Cam is a good, home based IP camera for security and basic surveillance. The main issue though is the cost. The camera itself costs £159, which places it as the highest of the home IP camera



▲ But it's quite expensive, for the camera and services

range in the group, of this similar product type. Then you'll need to factor in the storage of the video footage with the Nest Aware service, which can get extraordinarily expensive.

If the 1080p feature is an absolute must, then the Nest Cam is the one to go for. Otherwise, the 720p of both the iON and Belkin Device will surely meet your needs.







### iON The Home

iON's The Home may not be the most powerful home surveillance camera on the market, but it's one of the simplest and it works astonishingly well.

It's quick, easy and has the same features as a more expensive model, and the streaming and other services are fine and relatively inexpensive.



### TRENDnet 4-Channel HD PoE NVR Kit

If you're going to go for something a little more technical, then the TRENDnet 4-Channel HD PoE NVR Kit is the one to look out for. Like its smaller, and more compact sibling home surveillance counterparts, it's easy to setup and use and does a great job at monitoring your home or office. Plus, it's expandable and the PoE element helps cut down on the amount of cables needed for setting it up.

## How We Tested

Each camera was tested in both day and night time settings in a top secret location in deepest Suffolk. For connection to the apps we used a Note 4 with Android 5.0.1, and in the case of the connected and wired group entries we used a basic home setup with a BT Home Hub 5 as the main router.

	iON The Home	Swann DVR4-1500	TRENDnet 4-Channel HD PoE NVR	Belkin NetCam HD WiFi	Fusion Curve IP Cam	Nest Cam
Price	£130	£200	£350	£130	Up to £35	£159
Dimensions	86 x 95 x 46mm	DVR – 200 x 200 x 45mm/ PRO-735 – 96 x 53 x 85mm	NVR - 205 x 198 x 45 mm/TV-IP320PI - 60 x 60 x 152 mm	95 x 203 x 180mm	117 x 114 x 129mm	114 x 73 x 73mm
Weight	169g	1Kg/305g	1.2Kg/375g	272g	350g	203g
Resolution	720p	720p	720p	720p	720p	1080p
Night vision	Yes	Yes	Yes	Yes	Yes	Yes
Diagonal angle	102-degrees	59-degrees	89-degrees	90-degrees	105-degrees	130-degrees
Speaker?	Yes	No	No	Yes	Yes	Yes
Microphone?	Yes	No	No	Yes	Yes	Yes



# SUBSCRIBE NOW!



Subscribe to **micro mart** today and save on the single issue price.

Each issue of **Micro Mart** will be delivered directly to your device each week.

SEE NEXT PAGE FOR SET-UP INSTRUCTIONS



# ▶ HOW TO SUBSCRIBE...

## ...on an iPad or iPhone

- STEP 1** Return to the **Micro Mart library**
- STEP 2** Choose your subscription term and tap twice on the '**price**' box
- STEP 3** Choose whether to create an optional **PixelMags** account
- STEP 4** Enter your **Apple ID password** to confirm



## ...on a Kindle Fire

Kindle Fire subscriptions come with a **FREE** one month trial.

- STEP 1** Tap '**Free Trial Subscription**' in the **Micro Mart library**
- STEP 2** Chose your subscription term from the drop down menu on the popup that appears
- STEP 3** Tap '**Subscribe**'



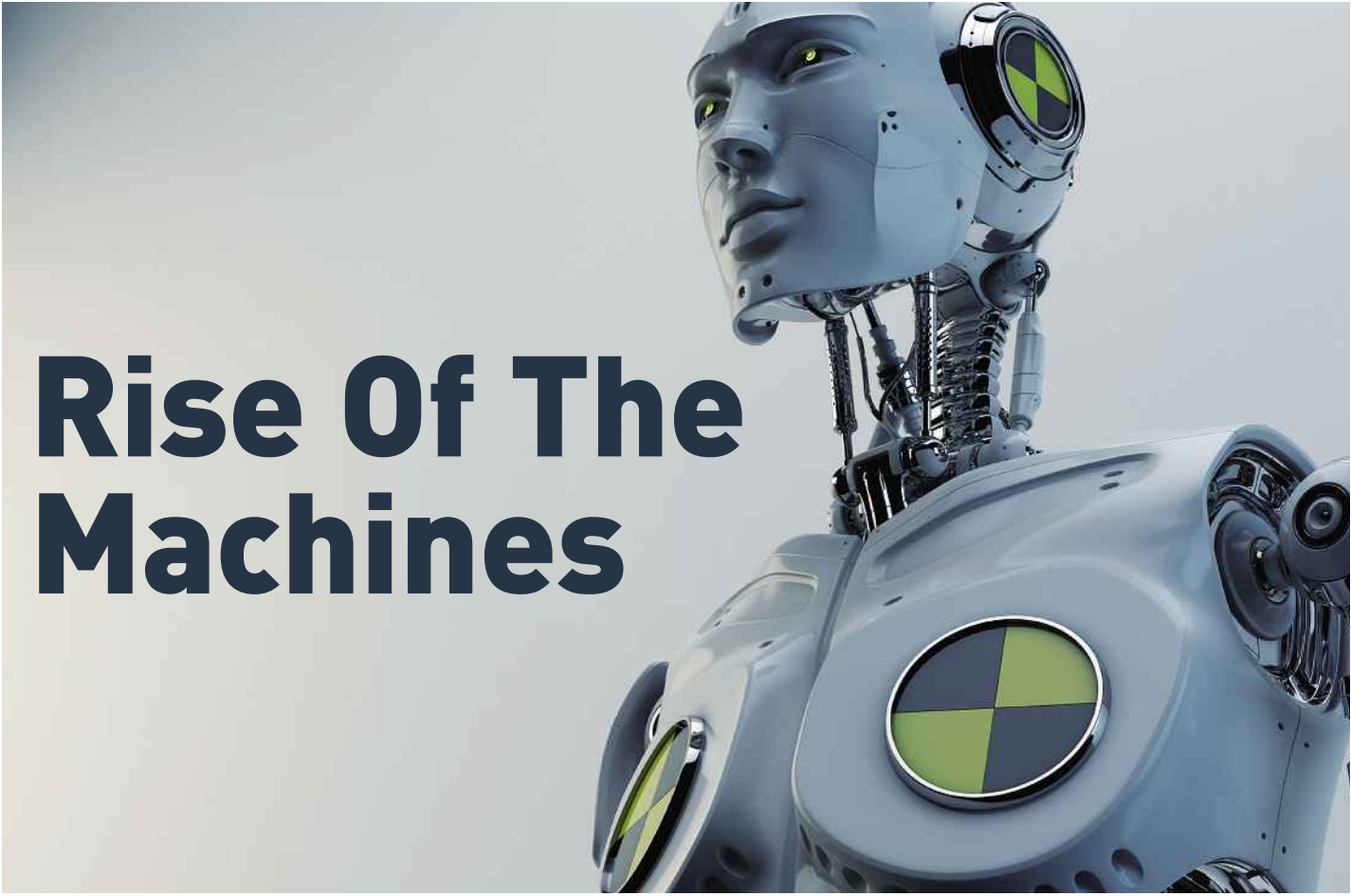
## ...via the Zinio app

- STEP 1** Search for **Micro Mart** via the search box in the **Shop tab**
- STEP 2** Tap the '**Subscribe**' button
- STEP 3** Choose whether to create an optional **Zinio** account
- STEP 4** Enter your **Apple ID password** to confirm



**Subscribe to *Micro Mart* today and  
save on the single issue price**





# Rise Of The Machines

**Facebook is building an artificial intelligence to better understand how we think. Google, IBM and the American military are also working on their own thinking computers. Rob Leane asks the sensible question 'are the machines going to rise up and kill us all?'**

**S**cientists creating machines that can think and/or robots that are smarter, stronger and better at surviving than us has been science a fiction trope since time immemorial. From 2001: *A Space Odyssey's* HAL 9000 to the *Terminator* franchise's sentient Skynet, there are plenty of fictional examples out there to make us scared of artificial intelligence.

Many movie stars – from Will Smith (*I.Robot*) to William Shatner (*Star Trek: The Original Series* 'The Ultimate Computer' episode) – have fought against computerised killers over the years, relentlessly reiterating mankind's paranoia over super-smart tech and its potential ulterior motives (which can normally be summed up as 'killing us all'). In 2015 alone, we've seen three AIs-gone-wrong on our cinema screens: Tony Stark nearly wiped-out planet Earth by creating a maniacally misaligned 'peacekeeping programme' in *Avengers: Age Of Ultron*; Arnie tried to stop Skynet from launching a killer app in *Terminator: Genisys*; and the fantastic indie flick *Ex Machina* saw Irish actor Domhnall Gleeson lured into a genius inventor's secret lab to witness the creation of the next big gadget – a humanoid robot based on insights from social media. Naturally, everything goes fairly wrong in all of those stories.

However, mankind's curiosity can't be stemmed by the movies. Labs all over the world, in real life, are working on developing

bigger and better artificial intelligences. Planned purposes for these machines include everything from enhancing social media to compiling military intelligence, so we decided to take a look at some of the projects on the table, in the hope of deciphering whether we need to be worried about a robot uprising...

## The Internet And Social Media

The internet has long had a whiff of sentience about it. For example when you start a Google search, but don't need to finish typing the sentence because the it's been finished it for you. Google, and other internet services, know *things*. They can predict our patterns and remember what we're interested in for long enough to point targeted ads in our direction. If you 'like' a clothing company's Facebook page, you'll probably be inundated with adverts from them.

Of course, this isn't artificial intelligence. This is just stored, processed information. Frequent searches, expressed preferences and shopping habits are all kept on record in various ways – unless you delete your history every five seconds, don't 'like' anything and refuse to use websites with cookies.

However, online services are beginning to probe into the realms of real artificial intelligence. You might have seen the pictures created using 'Deep Dream,' a project where Google turned its image





recognition software onto itself and asked it to recognise and process whatever it could.

The resultant images are trippy, distorted and somewhat beautiful. No one drew these images, the software adapted them itself from the information it was given. It may not be 'intelligence' in the traditional sense, but it certainly shows that computers are capable of doing things for themselves, and coming up with interesting results.

Google also currently has 23 self-driving cars in development, and although there have been a string of accidents (mostly down to human error, it seems), they're legal in four U.S. states. The cars haven't been tested in icy conditions yet, and they reportedly have problems recognising that some objects (litter on the road, for example) are harmless. So far, the cars can't recognise temporary traffic lights either, because they use pre-programmed route information as a guide. However, the project could become a major technological achievement if all goes to plan.

Google predicts that vehicles such as these will be available for public purchase by 2020. John Markoff of *The New York Times* predicts that this technology will force an upheaval of motor-based law, because "the technology is now advancing so quickly that it is in danger of outstripping existing law, some of which dates back to the era of horse-drawn carriages."

Google isn't the only online business to be investigating artificial intelligence, either – Facebook are at it, too. Mark Zuckerberg's social media firm hired AI and 'deep learning' (a form of algorithm-based learning, similar to Google's Deep Dream) expert Yann LeCun in 2013 to helm its new lab, focusing on "the full spectrum of topics related to AI, and to deriving knowledge from data: theory, algorithms, applications, software infrastructure and hardware infrastructure."

The lab's long-term goals are to understand intelligence and build intelligent machines. As well as using this to personalise your newsfeed more effectively than before, they also envision implementing

intelligent safeguards to warn you when posting potentially-embarrassing drunken selfies. An example of 'deep learning' already in use at Facebook is the way that the social network remembers faces you've tagged several times before.

Facebook has coupled this project with research into internet-signal-distributing drones and Oculus Rift virtual reality technology. It's all in a bid to keep Facebook at the top of the social media pile, to stay up-to-date with technological trends and to offer the smartest ways to connect going forward.

Twitter are also researching deep learning, and online start-up DigitalGenius recently raised \$3 million to research the potential application of AI in the field of customer service. Put simply: the internet is investing hard in AI technology right now.

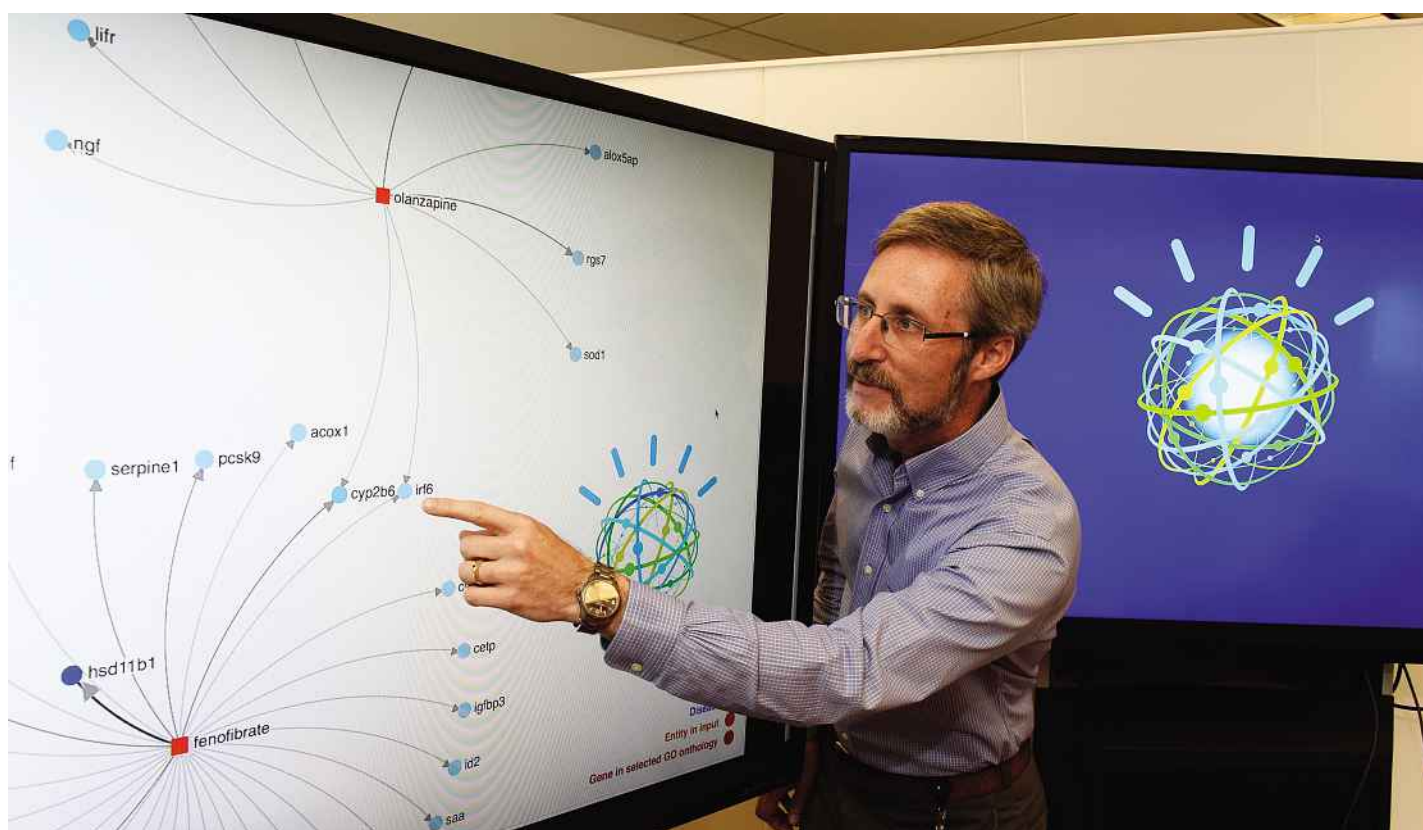
### Medicine

There's also the potential for medical applications of artificial intelligence, as you may have seen in the news recently. IBM acquired the company Merge Healthcare Inc. during the first week of August 2015, for the sizeable fee of \$700 million. The reason for this deal would seem to be Merge Healthcare's collection of 30 billion medical images. These include X-rays, computerised tomography, imaging scans and more. With this database now in its possession, IBM intends to teach the super computer Watson everything it possibly can about the world of medicine. You may remember Watson from his appearance on the American quiz show *Jeopardy* in 2011.

Originally, Watson was built to beat this quiz and prove that artificial intelligence could trump human knowledge, even without an internet connection. He beat two former winners from the show and took home a cool \$1 million prize fund.

In 2013, Watson's first commercial application came in the world of medicine. His expert knowledge in lung cancer is being trialled by the Maine Centre for Cancer Medicine and the Westmed Medical





Group in New York. Specifically, they're using Watson for 'utilisation management decisions' and as a 'clinical decision support system,' meaning that he gives his 'opinions' on potential treatments.

Watson makes treatment suggestions based on a huge pile of information, including the patient's history, treatment guidelines, electronic medical record data, notes from physicians and nurses, research materials, clinical studies and journal articles.

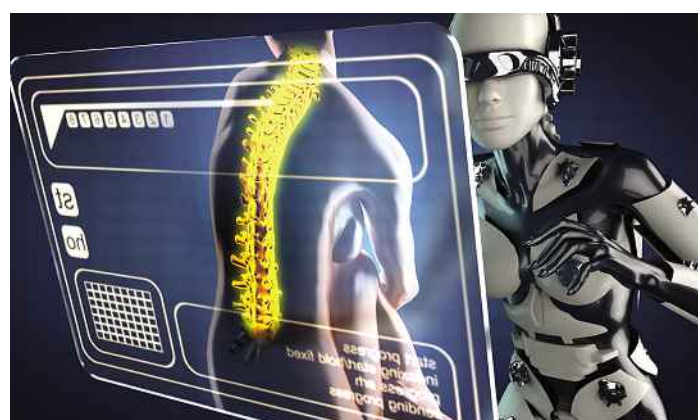
The 30 billion images now owned by IBM, thanks to the acquisition of Merge Healthcare, will now be used to 'train' Watson to identify 'ailments such as cancer and heart disease.' The idea seems to be to expand Watson's knowledge and move towards using him for diagnosis as well as treatment advice. Essentially, IBM is researching whether similar processes to the way that Facebook recognises your friends, or that Google can recognise an image of dog, to identify tumours and other signifiers of disease. Their work seems to be based around the same 'deep learning' theory as Google and Facebook's developments – if computers can analyse images and spot patterns without our help, there could be countless benefits to the world of medicine.

However, "It's a way off to have a general diagnostic machine," says John Eng, an associate professor of radiology at Johns Hopkins University, who was questioned about the project by *The Wall Street Journal*. "In medical data, there's lots of ambiguity and lots of fuzziness," he explained. "It's kind of messy data, and I think that's going to be a limiting factor with what IBM does with Watson."

So, it may be a long time before IBM hit the jackpot and produce a functioning diagnostic machine, but it's certainly interesting and inspiring to know that they're working on it at all. If they can crack the code, Watson could potentially save a lot of lives.

## Military

The Defence Advanced Research Project Agency (DARPA), is an offshoot of the U.S. Department of Defence, dedicated to investigating and funding the development of emerging



technologies, for use by the American military. It's been around since 1958, and played a core role in developing Shakey The Robot – widely cited as the first general-purpose mobile robot with the power of reasoning – between the years 1966 and 1972. The work of DARPA is integral to our understanding of AI today.

Recently, it's been looking into image recognition AI, too. If you haven't already spotted the pattern forming, computers' abilities to scan photos quicker than the human eye is the core of a lot of AI research going on at the moment. DARPA are working on an artificially intelligent system called Visual Media Reasoning, that can detect the contents of an image and group together similar sightings across pictures and video.

In terms of searching for a specific military target, a system that could search a huge library of images in seconds and track down the right person, car or device would surely become an integral part of global security. Of course, surveillance programs already exist, but a super speed AI version could surely enhance and improve the process.

Research from Arizona State University has been covering similar ground. With the internet serving as a recruitment and



communication device for terrorist groups such as the so-called Islamic State, it is investigating if there's a way that artificial intelligence could help thwart plans and pin-point locations? Its research suggests that AI could help the war on terror. Using an algorithm that analysed 2,200 recorded incidents of Islamic State activity, the researchers managed to find connections between certain air strikes to roadside bombs, and link this to jihadi military-style tactics. Essentially, they found evidence to suggest that airstrikes against IS resulted in a change in tactic towards improvised roadside weapons instead of larger assaults.

This type of tactical knowledge could become vital intelligence, and there's a chance that this kind of AI-powered research could prove useful to the U.S. government. Elizabeth Quintana, director of military sciences at the Royal United Services Institute, said this about Arizona State's research, to BBC News: "The military has access to a lot of information. They need a way to bring it down to a digestible format. Analytics is definitely the way to do that."

As pattern-spotters, artificial intelligences could prove better than any human eye or brain. There's no reason this should stop with the likes of Facebook. Collaboration between the right labs and the right military could prove a vital asset to protecting human life.

**“ Our social interactions, our knowledge of military threats, and the nature of our medical care all stand to improve ”**

What about artificial-intelligence-based weapons, though? Are they being discussed? Well, they're certainly plausible. In fact, links between weaponry and AI have set a few alarm bells ringing amongst the scientific community recently. Seeing as a connection between artificial intelligence and warfare is essentially the inciting event of *The Terminator* films, this writer is a little concerned, too. Indeed, Apple co-founder Steve Wozniak, Google DeepMind chief executive Demis Hassabis and the world-famous Professor Stephen Hawking (and over 1,000 AI and robotics researchers) all recently signed an open letter urging governments not to dabble in the militarisation of artificial intelligence.

"AI technology has reached a point where the deployment of [autonomous weapons] is – practically if not legally – feasible within years, not decades," reads the letter. "And the stakes are high: autonomous weapons have been described as the third revolution in warfare, after gunpowder and nuclear arms."

"The endpoint of this technological trajectory is obvious: autonomous weapons will become the Kalashnikovs of tomorrow," the letter states. "The key question for humanity today is whether to start a global AI arms race or to prevent it from starting."

Stephen Hawking has been vocal about these concerns on other occasions, too. He told the BBC last year that "the primitive forms of artificial intelligence we already have, have proved very useful. But I think the development of full artificial intelligence could spell the end of the human race."

Stopping the development of AI weapons may prove difficult to implement internationally, though, and – at time of writing – its unclear whether any such research is taking place anywhere in the world.

## So So We Need To Be Scared?

SpaceX CEO Elon Musk has described AI as 'our biggest existential threat', and Apple's Steve Wozniak thinks that the development of artificially intelligent robots could result in a society where humans play "the family pet" to a society that's "smarter than us."

When terms like that are being banded about, along with Hawking's 'the end of the human race' line, it's easy to be frightened about where AI technology is headed.

At this stage, though, this writer would say that there's no immediate concern. Although they're known to constantly be working on robots, the most recent press story to come out of DARPA showcased their work around teaching their androids to play jazz music. This was part of a project to encourage improvisation in artificial intelligence. Improvisation can be a key skill in battle, after all.

If DARPA, one of the biggest-funded military science labs in the world are only at this experimental stage, then we can probably take a little solace from the jazz-robot story. For starters, it seems like the chances of robots being smart enough to take over the planet is a long way off. On top of that, at least they'll kill us all whilst bashing-out a cracking slap bass solo at the same time.

On a serious note, though – recent AI research has mostly been for the good of mankind. Our social interaction, our knowledge of military threats, and the nature of our medical care all stand to improve from the current developments across the globe. Many of the world's leading scientists are lobbying against AI weaponry, too.

Maybe I'll look back on this article one day, from a post-apocalyptic bunker of some kind, waiting for the musical machines to find and kill me, and laugh about just how wrong I was with my upcoming closing sentence. But heck, I'll write it anyway: at the time of writing, I think we're safe from a robot uprising. [mm](#)





# Oh No

# Lenovo



**The world's top computer builder has been caught leaving its devices potentially vulnerable twice in the space of a year. Will it ever learn?**

It's been little more than six months since Lenovo, the world's largest shipper of PC technology – with nearly 20% of the market in 2014 – pledged to end the installation of third-party software on its machines. The announcement (which can be seen at [tinyurl.com/ktzcpjr](http://tinyurl.com/ktzcpjr)) came in the wake of a furore surrounding a piece of software called Superfish, which had the capability to intercept and look at encrypted traffic in order to display adverts.

It was, at best, a dodgy piece of bloatware that watched what you were browsing for and generated probably-unwanted ads based on that information. At worst, it could be characterised as malware that undertook a man-in-the-middle intercept of traffic by issuing itself dodgy SSL certificates, which could then be exploited to compromise other Lenovo laptops with the same software installed.

Either way, it wasn't a good look, and became just about the biggest cause celebre of its type since Sony thought it would be a good idea to install a rootkit on any PC that played host to one of its CDs.

While Lenovo initially tried to frame Superfish as a helpful visual search tool, the strength of disdain amongst its users – not helped by Forbes' discovery that Lenovo

was paid as little as \$200,000 in order to install the software and compromise its customers' security – soon lead to it taking steps to remove Superfish from machines, clear up its mess, and begin making the aforementioned promises. It was, to say the least, a PR disaster; yet Lenovo keeps growing in the market, and here we are again in a situation where it, while not breaking its promises as such, has managed to annoy its user base.

## **LSE Is More**

Recently, news broke of problems surrounding the Lenovo Service Engine (LSE), a piece of software that takes advantage of a feature in Windows 8 onwards that allows OEM installers to embed an executable in the firmware of a machine. Because this executable will then run at boot, it can potentially be used to ensure that a firm's chosen suite of software cannot be removed from a machine, even by a clean install of Windows. While not all makers are exploiting this feature, Lenovo was; on desktop systems it was apparently used to send basic system information to its servers when a machine first connected to the internet, but on laptops it was doing much more.

Within its portable machines, LSE was employed to check whether Lenovo's software update facility was installed and, if not, reinstall it. This tool (known as OneKey Optimizer) could then, in turn, download and install drivers and other software Lenovo wished it to. To anyone with a modicum of knowledge about such things, then, it will come as no surprise that a security researcher – specifically a chap by the name of Roel Schouwenberg – eventually managed to exploit the software to gain control of a system.

By the start of August, Lenovo and Microsoft had moved to plug the security flaw; the former by issuing advice, tools and new BIOS firmware alongside a list of affected machines (see box outs) and the latter by changing its protocols for how the Windows feature should be used (you can read that at: [tinyurl.com/oo2nfdy](http://tinyurl.com/oo2nfdy)). Interestingly, though, Lenovo's advisories made it clear that the issue also affected these specific models even if they were using Windows 7, despite that OS not having the same in-built feature to allow it. Indeed, it was an anomaly that had been noted as early as June on the forums of *Ars Technica* ([tinyurl.com/neb26k5](http://tinyurl.com/neb26k5)).

In this case, LSE apparently re-wrote a system file called `autochk.exe`, in order



## Lenovo Machines Affected

If you have any of these Lenovo models, then you need to be aware of the LSE problem. While it appears a more serious issue for laptop owners than for those with more conventional PCs, there are now ways to remove it from either type of system (see other box out):

### Notebook

Flex 2 Pro 15 (Broadwell/Haswell)  
Flex 3 1120/1470/1570  
G40-80/G50-80/G50-80 Touch  
S41-70/U41-70  
S435/M40-35  
V3000  
Y40-80  
Yoga 3 11/14  
Z41-70/Z51-70  
Z70-80/G70-80

### PC

A540/A740  
B4030/B5030/B5035/B750  
H3000/H3050/H5000/H5050/H5055  
Horizon 2 27  
Horizon 2e(Yoga Home 500)  
Horizon 2S  
C260/C2005/C2030  
C4005/C4030/C5030  
X310(A78)  
X315(B85)

to allow the system to “fetch files over unencrypted HTTP”. Lenovo, rather shamefully, straight-batted Ars’ attempts to clarify exactly how it was managing to achieve this, instead referring it to its statement on the matter ([tinyurl.com/o9mhl5](http://tinyurl.com/o9mhl5)), which reiterated its commitment to removing LSE altogether.

## Curing The Bloat

When, in the wake of the Superfish affair, Lenovo assured its customers that “the events of last week reinforce the principle that customer experience, security and privacy must be our top priorities”, this was probably not what owners of its hardware were expecting. While use of LSE has now been stopped, and all machines manufactured after June should be clear of it, it’s more damaging press for the

“Here we are again in a situation where it, while not breaking its promises as such, has managed to annoy its user base”

Chinese company. How should we view it, though? With paranoia, or a shrug and BIOS update?

In the wake of that Superfish announcement, it stands to reason that changing more than two decades of industry culture (whereby the shipment of software with PCs has become standard) can’t be easy. PC builders are used to striking deals to ship certain packages with their kit, or pushing their own in the hope

of reaping the benefits. Indeed, one can see how it’s a handy chunk of revenue now, at a time when margins are getting tighter.

The benefits of LSE to the customer are debatable, but its employment (and, indeed, the Windows feature that facilitates it) is understandable as a product of that ingrained culture. It’s the same culture, after all, that has lead to it becoming virtually impossible to get a vanilla install of Android, and an ethos that Apple has basically built its OS’ iterations upon. Everyone has been playing the same game.

None of this is necessarily bad, or a damning indictment of Lenovo. LSE could be seen as clumsy misstep, rather than anything as insidious as Superfish suggested (though its employment within Windows 7 systems

doesn’t look great, we’ll grant you). Whether its poor decision making here even registers beyond technology pages is questionable, but it’s clear that Lenovo has serious lessons to learn – as do many others.

Playing fast and loose with security is not acceptable, no matter the quality and price of your product. Not least because a catastrophic fall from grace can be brutally quick – and is never much further away than just around the corner. [mm](#)

## Removing LSE

Lenovo has, so far, released two security advisories regarding LSE, one for its laptops ([tinyurl.com/p8ocfwt](http://tinyurl.com/p8ocfwt)) and one for desktops ([tinyurl.com/p3mbpha](http://tinyurl.com/p3mbpha)). As we noted in the main copy, the installation of OneKey Optimizer on laptops is the factor that introduces real security issues, but both notices outline methods to remove LSE completely.

### Laptop (Windows 8, 8.1 and 10 in UEFI mode)

1. Run the Lenovo LSE disabler tool (download from [tinyurl.com/ojrd4su](http://tinyurl.com/ojrd4su)) as an administrator, this will cause a command line window to pop for about 30 seconds while the disabler tool stops the LSE service, deletes all files installed by the LSE module (C:\windows\system32\wpbbin.exe; C:\windows\system32\LenovoUpdate.exe; C:\windows\system32\LenovoCheck.exe), repairs the autocheck files in Windows and disables the UEFI variable that enables LSE.

2. You can then Restart your PC

### Desktop (For Windows 8 and 8.1)

In order to disable LSE on desktop systems, please complete the following two steps:

1. Disable LSE in the system BIOS. Ppress F1 while the system is booting to get to the BIOS. Navigate to the Security tab and set the Lenovo Service Engine option to “disabled”. If you do not see these options in the BIOS LSE is not enabled in your system and running the disable utility is not needed. Press F10 to Save and Exit.

2. Get the RemoveLSED utility from [tinyurl.com/p9cybrs](http://tinyurl.com/p9cybrs). Boot to Windows. Right click on the “RemoveLSED.bat” file and select “Run as Administrator” or remove the following files on your system: C:\windows\system32\LSED.exe and C:\windows\system32\LSEPreDownloader.exe

**Note:** If you are running Windows 7, or anything newer in a legacy mode, you need a full BIOS update – details can be found at [tinyurl.com/p8ocfwt](http://tinyurl.com/p8ocfwt).



# Code With AI2

## Timer (Part 2)

### Build a useful Android timer app with David Briddock

Last time we created a simple yet useful timer app with AppInventor 2 (AI2). This week we'll extend this app by adding more components and additional coding blocks. Remember, all you need to play along is a Windows/Mac/Linux PC, web browser and Google account. Ideally you'll also have an Android smartphone or tablet, but even this isn't essential.

#### What We'll Learn

This week we'll add some new interface components, namely timer start and stop buttons, which will be contained within a horizontal layout component.

We'll also explore a faster and smarter app testing option that involves a real Android device. Then discover how to make source backups and deploy apps onto a real Android smartphone/tablet. So let's get started.

#### Designer Changes

In your browser navigate to the AI2 home page ([ai2.appinventor.mit.edu](http://ai2.appinventor.mit.edu)) and sign in with your Google account. Once signed in select the 'My projects' option in the Projects menu (or use the single-click 'My

Projects' shortcut further along the menu bar). Select the 'MMTimer' project we created last time.

We're automatically placed into Designer View mode. Here we'll add two buttons, one to start the timer and reset the count to zero, and another to stop the timer.

#### Layout

We want to place these buttons next to each other. For that we'll need a layout. From the Layout group in the components Palette grab a HorizontalArrangement and drop it towards the bottom of the Screen1 area. A blue bar appears to indicate its drop location.

With the HorizontalArrangement1 component selected in the Properties panel set the Width value to 'Fill parent...' from the popup list.

#### Buttons

Now grab two Button components from the User Interface group, one at a time, and drop them onto the HorizontalArrangement1 component. They will appear side by side. Now rename the left button to 'StartButton'

and the right to 'StopButton'. Select the StartButton and click the FontBold checkbox then set the Text value to 'Start', the Width value to 'Fill parent...', the FontSize to '48.0' and the TextColor to 'Green'. Do the same for the StopButton except set the Text value to 'Stop' and the TextColor to 'Red'.

That's the Designer changes done. Now it's coding time, so click on the Blocks View button.

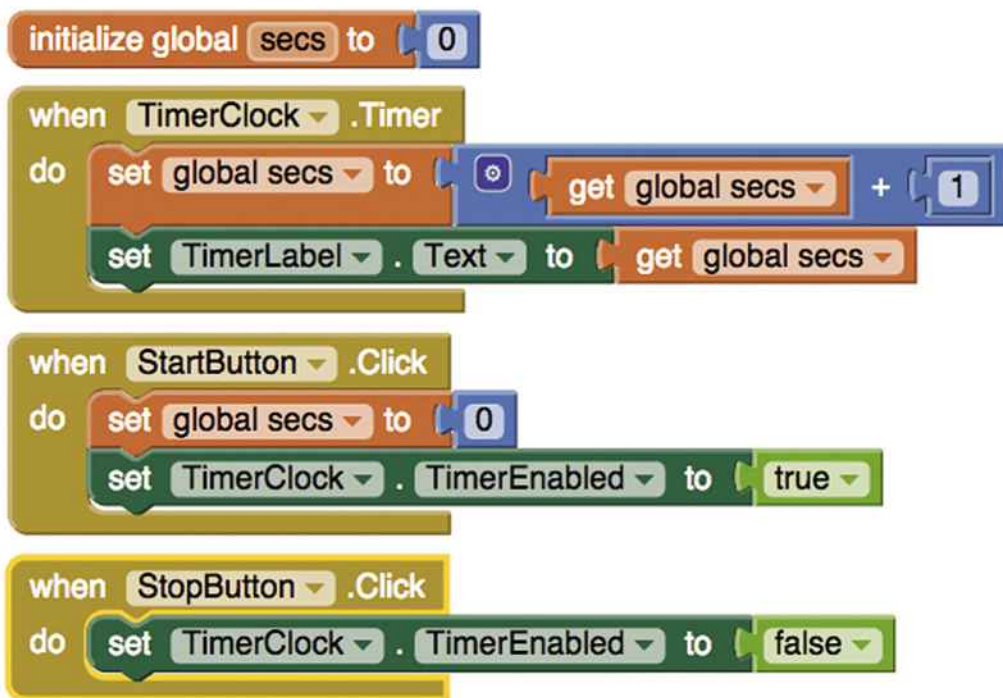
#### Coding Blocks

We need to define the Start and Stop button click event behaviour.

Select the StartButton component in the lefthand Blocks panel, grab a brown 'when StartButton.Click' block and drop it onto the coding area. Now we need to populate the empty inner space, which as you can see from the Blocks View image contains two other block elements.

The first is a brown 'set global secs' block from the Variables group. Snapped to the end is a blue Math number block with a value of zero. The second green 'set TimerClock.TimerEnabled' block is from the TimerClock component. Snap on a Logic group 'true' block to begin generating clock 'tick' events.





▲ AI2 Blocks View

From the StopButton component grab a brown 'when StartButton.Click' block and drop it onto the coding area. Inside is a single block, namely a 'set TimerClock.TimerEnabled'. However, this time we need a Logic group 'false' block to stop the clock generating 'tick' events.

And that's the coding done. Ensure the warning and error counts in the bottom left corner are both zero then carefully check your code against the Blocks View image.

## Testing

Last time we used the Connect menu's Emulator option to test the app. We could use this again.

However, the emulator takes a while to start up. More importantly we cannot test some functionality without using a real Android device, for example feedback from orientation, motion and GPS sensors.

Fortunately there are two other testing options, which use an Android smartphone or tablet.

## AI2 Companion App

The best app testing experience is with the free AI2 Companion app. Installed on an Android device it communicates over a USB connection or a local wi-fi network. Go to the Google Play Store ([goo.gl/VcZNRl](http://goo.gl/VcZNRl)) and install the AI2 Companion app onto an Android smartphone or tablet.

For the wi-fi option both the device and PC must use the same wi-fi network. Start the AI2 Companion app on your Android

device then select the 'AI Companion' option in the Connect menu. Set the six character 'handshake' code by typing it in, or using the 'scan QR code' option (pointing the device's camera at the QR code).

For the USB option attach the cable, then enable the Developer USB Debug mode ([goo.gl/chuXJX](http://goo.gl/chuXJX)). Now start the AI Companion app and choose the AI2 Connect menu's USB option.

“ We can create a self-contained Android package file (APK), which can be installed on an Android smartphone or tablet ”

After a short pause our app should start running. Every time a Designer View change occurs the app is restarted. So it's a great way to experiment or fix any bugs.

## Source Export

All our work is saved in the cloud. But we can also download the app source to our PC. This export file bundles together all the design and block coding information into a single file with an AIA extension (which in reality is just a standard ZIP file).

It's easy to do. Just select the 'Export selected project (.aia) to my computer' option in the Projects menu. The same menu also has an option to import AIA

files. So, if you discover other AIA files on the web you can import them into your project list.

## Android Device Deployment

In addition we can create a self-contained Android package file (APK), which can be installed on an Android smartphone or tablet. The same file can also be uploaded to the Google Play Store.

Use the Build menu to compile an APK and save it to your PC. Compilation time varies depending on the complexity of the app. Now this APK file can be 'side-loaded' onto an Android device via a USB connection. This process involves a number of actions on both the Android device and the PC, as described in various online tutorials ([goo.gl/ZMKgAe](http://goo.gl/ZMKgAe)).

## Going Further

Feel free to experiment with this app. For instance, modify the font size and colour, change the label text to show minutes and seconds, or maybe add a third Pause button. Have fun. Next time we'll build a motion-controlled dice shaker. [mm](#)



▲ AI2 Emulator



# Is It Time To Give Second Life A Second Chance?

As online communities go, it's hard to get more ambitious or, frankly, bizarre than *Second Life*. Isn't it all a bit passé, though? Sarah Dobbs looks into the state of the virtual world...

Remember *Second Life*? Sure you do. When the online virtual world was launched by Linden Lab back in 2003, it was meant to be revolutionary. Not quite a game, not quite a chatroom, *Second Life* was supposed to represent, well, a second life. It was a forum for users to reinvent themselves, to create avatars that represented themselves – physically accurate or not – and meet other people. It caused any number of headlines; couples met in *Second Life* and got married, fraudsters found victims in *Second Life* and ripped them off, psychologists debated whether or not spending time in *Second Life* was healthy.

Then, well, most people sort of lost interest. Once *Second Life* was no longer the next big thing it just became a thing, and users moved

on. Facebook launched, Twitter launched, people got into Instagram and Snapchat, and *Minecraft* filled the creative sandbox niche for people who missed the world-building bits. We forgot all about *Second Life*. Or did we? After all, *Second Life* still exists. So who's still using it, and what for? Let's find out...

## A Second Look

Since there's nothing like a bit of first-hand research, I decided to log into *Second Life* and take a look around for myself. Having picked an avatar more or less at random and doing zero customisation to her, I jumped straight in and landed on a beach where various other people seemed to be standing around – but all of them had “away” signs floating above their avatars. Which was a bit disappointing, but



▲ Lots of avatars but no action





▲ Another lovely bit of scenery, but it's abandoned...



▲ Choosing between "people" and "vampires" lets you know in advance what you're signing up for

Second Life is a sprawling world with lots of different locations, so I optimistically assumed I'd be able to find people elsewhere.

My first teleport destination was another beach, supposedly a social location. And sure enough, there were a group of people standing on a deck chatting to one another. The conversation wasn't going anywhere, though; one guy was trying to sell something called 'fairy weed' and other people were either asking him what it was, or laughing it off. I loitered around them for a bit but it wasn't much fun, so it was time to find more people.

“ There are people still in Second Life at any given time of day, but it's the specialised worlds that are getting traffic ”

Clicking through the various "editors' pick" locations didn't find many other Second Lifers, though. Whole landscapes were barren of people and, while the scenery was nice, it was a bit disappointing to see there were only one or two other people in any given place. Granted, it was about 2pm on a weekday when I went looking, which probably isn't peak Second Life time, but still, I thought there'd be more people somewhere.

Eventually, I found them: in the Adult locations. Having teleported into a beach party, only to find I wasn't welcome because my avatar didn't have a bikini, I watched a few animated dance routines, and clicked through the other populated worlds. None of them sounded my cup of tea, and after accidentally dropping into a pretty disturbing one, I logged out in a hurry. As investigative journalism goes, it's not the most insightful, but I did find out one thing: there are people still in Second Life, but it's the specialised worlds that are getting traffic.

## A Second Chance

Admittedly, one anecdote about during a random one-hour period doesn't tell you much, but trying to pin down any facts on exactly what's going on in Second Life at the moment is trick because there isn't much information, and what there is seems contradictory. Here's what we do know: back in 2013 Linden Lab claimed more than 36 million Second Life accounts have been set up, and users had jointly spent the equivalent of 217,266 years logged in (about two days per person, roughly); at its peak, it had 1.1 million active users (and, as of this March, it had around 990,000).

That last comparison is interesting, as it isn't a devastating drop in numbers. It makes one wonder why everything seems to have gone so quiet on the Second Life front, though, and why Linden Lab stopped publishing its once-regular reports on user levels.

Frustratingly, it's also tough to know who those 990,000 users might be. Demographics for such services are always a bit unreliable, because all anyone knows is what users disclose. You're required to fill in a bit of info when you first sign up for Second Life, including your date of birth, but no-one actually checks, so there's nothing to stop you lying.

## The Linden Dollar

Part of the reason Second Life was so interesting to the media was that people made money from it. It wasn't just that people were using it to communicate – they were using it to generate an income by selling things that didn't really exist. Existing solely in the virtual world, independent of any country, Second Life has its own economy – and its own currency, the Linden dollar.

To buy or sell things inside Second Life, users need to buy Linden dollars using real money, and then use Linden dollars to buy goods or services. Like in many MMORPGs, Second Life users can buy custom items for their avatars, like clothes, body modifications, or even pets; they can also buy custom animations that let their avatars do things or move in new ways.

And then there's the real estate market. Land isn't unlimited in Second Life, though Linden Lab can make more of it, but people have made fortunes by buying empty plots of land inside the virtual world, developing it by building virtual buildings – sometimes extremely elaborate ones – and then either selling it on or renting it out. The better you are at creating in-world content, then, the more money you can make out of it by finding people who want what you've got.

Turning Linden dollars back into real-world cash involves going back through the currency exchange, LindeX. Despite the massive fluctuations on the real markets, especially during the financial crisis that began in 2008, the rate of exchange on the LindeX exchange has remained pretty stable – in the region of 250 Linden dollars per American dollar.

Think about this system for too long and you might find your head spinning. It's a made-up currency that people actually spend time and effort earning, and then turning into real money; it's also an economy that can't really be affected by much, beyond the spending power of Second Life's user base (at least no-one's going to starve if they don't have any money to spend inside Second Life for a few weeks). Recent figures are hard to come by, but in 2009, Second Life's economy was around \$567 million. Considering signing back up again now?





▲ A swish-looking public hangout, but where is everyone?



▲ Aha! Everyone's hanging out in the Adults-only areas

## Second Thoughts

What we do know, though, is that the brands and institutions who flocked to Second Life when it was being reported as the essential place for online networking have all but given up on the platform. Reuters used to have a virtual office in Second Life, with two reporters on the beat reporting on Second Life news, but that was closed down in 2008. American Apparel opened a shop in Second Life, but closed it after a year. And Harvard Law School held an experimental class in Second Life, but several students had trouble accessing the class thanks to the school's firewalls, and the experiment was abandoned. There are plenty more stories like those – brands steamed in all vigour and enthusiasm, then realised it was harder or less profitable to run events in Second Life than in real life, and steamed back out again.

Despite the lack of headlines and perceived interest from the general public, though, Second Life still seems to be making money. According to Linden Lab, there are 1.2 million transactions carried out daily in its virtual world; despite the global financial crisis, the exchange rate still stands at 247 Linden dollars to the US dollar. At the time of writing, the daily market data showed a volume of L\$18,330,581 – meaning about \$74,213 had changed hands inside Second Life that day.

What's really changed might be perception. When Second Life first launched, it was exciting and new and everyone wanted a piece of it. Then its limits started to become obvious, and, well, human nature kicked in, with people looking for the same kind of illicit thrills in their avatars as they might fantasise about in real life.

A couple of years ago, following a staff reshuffle at Linden Lab (Philip Rosedale stepped down as CEO and was replaced by Mark Kingdon, then Rosedale took over again, then resigned again to be replaced by Bob Komin) Second Life was re-organised and ostensibly cleaned up. In-world casinos were shut down, and porn-related material was shunted off to a different part of the 'world'. Did anything really change though? Nope. People were still using Second Life for its explicit content, but instead of that being everywhere, it was sectioned off, leaving the rest a of virtual ghost town. Nothing really stepped in to fill the gap, and while regular users still met up with their friends there, the buzz was gone. It wasn't exciting any more.

## Second Life Timeline

**1999** – Philip Rosedale set up Linden Lab. Initially, he imagined creating wearable hardware that would let the user interact with a virtual world through a headset; that vision was eventually replaced with a computer based model.

**2003** – The first iteration of Second Life launched!

**2004** – Second Life user Anshe Chung (real name: Ailin Graef) starts developing animations and selling them to other users. She would go on to become Second Life's first millionaire – making \$1,000,000 purely through selling virtual goods.

**2006** – BusinessWeek featured Anshe Chung on its cover, and mainstream coverage of Second Life came rolling in. As a result, Second Life's sign up rate skyrocketed.

**2006** – Twitter launched, and Facebook also opened itself up to anyone over 13 – not just university students – and as they grew in popularity, Second Life started to fall out of favour.

**2008** – Second Life won a Technology And Engineering Emmy Award, but Philip Rosedale stepped down as CEO to be replaced by Mark Kingdon.

**2009** – Second Life hit its peak, with more users than ever before.

**2010** – Things started to look wobbly, and Linden Lab laid off some 30% of its employees in an effort to cut costs. Mark Kingdon stepped down, replaced temporarily by Philip Rosedale again, before Bob Komin became CEO.

**2014** – Ebbe Altberg was hired at CEO, and vowed to lead the company into a new stage of growth – his plans included creating a next-gen virtual reality version of Second Life.

## A Second Try

That might be set to change soon, though. Linden Lab is working on something new that might re-ignite all that Second Life excitement all over again. According to a press release it issued last year, the new project is going to be a "next generation virtual world" in the spirit of Second Life. Again, users will be able to create anything they want, and those who generate popular content will, we're told, be able to monetise it within the community.

Those who've stuck with Second Life over the years don't need to panic, though. Linden Lab has moved to assure them that this doesn't mean it's planning to abandon its first virtual world. It's making it clear that this new version will be mostly compatible with the original Second Life, but will take advantage of the ways in which technology has changed since 2003. There's even meant to be integration with current virtual reality cutting edge, in the form of the Oculus Rift – which harks back to Linden founder Philip Rosedale's original vision for the project as a 3D virtual world users could move around inside via a virtual reality headset.

Oculus Rift has done a pretty good job of grabbing headlines of its own over the last year or so, so the tie in might well attract more attention to Linden's new baby. The newest new CEO, Ebbe Altberg, reckons the upcoming iteration of Second Life will be more robust, more accessible, and way more appealing to the world at large than what is currently on offer. So, while Second Life might feel like a ghost town right now, Linden Lab will be hoping it won't be leaving it that way for long.

Still, unless you're into virtual beach parties with explicitly named avatars, it's probably worth waiting for the reboot before paying it another visit. **mm**



# Top 5

## Things That Are Only Okay On Social Networks

Sometimes, what happens online should stay online... And for good reason

### 1 Following Strangers

In the 'Twitterverse', having hundreds, thousands or even millions of followers is a badge of honour, a mark of your worth. People want you to follow them. Offline, that same attention-grabbing behaviour would, at best, attract funny looks and insults... but for the follower, it would probably land them in the dock. Yes, for some reason being online makes following complete strangers okay, and somehow the word 'stalker' never comes into it. Anyway, to find out more about how much we disapprove of this whole Twitter thing, follow us @micro\_mart.

### 2 Poking People

Thankfully, the 'Poke' feature in Facebook has long since reached Peak Poke and subsequently fallen into decline. These days, no one really bothers with it, do they? Yet, for a while, everyone was poking everyone else willy nilly; it was chaos. It also made no sense whatsoever. Sure, if you want to get the attention of someone who isn't responding to your vocal prompting or a you waving hand in front of their face (and you don't mind being considered rude and willing to invade someones personal space, then you might resort to a poke. On Facebook, however, people were just clicking the Poke button for the hell of it. Imagine how annoying that would be in the real world.

### 3 Vocally Leaving

For some reason, from time-to-time, you will come across people who feel the need to publicly declare their reasons for leaving Facebook, with a long post outlining their gripes in case you were in any doubt, and/or cared. Maybe it's just us but, in the real world, when we leave, say, a party, we do our utmost to resist the urge to stand up in the middle of the room and explain exactly why we're planning to make an exit. So, you won't hear us saying, "Excuse me, everyone, but please all shut up and listen to me. I'm now leaving, because I feel like some of you are far too critical, and anyway, this whole party thing is taking up too much precious time, when I really should be at home doing something more productive. Good bye." Of course, part of the reason we don't do that is because we never get invited to parties any more.

### 4 LOLling

On the internet, no one can hear you laugh. Well, not unless you record it and put it on YouTube. Assuming you don't do that, though, then the LOL is one popular way to let other people know you find something they've written amusing. To be honest, we're not that keen on it, but we'll allow it. What we won't accept, however, is people saying it in real life, instead of, well, laughing. It just goes to show, though, some people can't differentiate from web and the actual physical world. A depressing thought, indeed, which makes us feel very frowny emoticon.

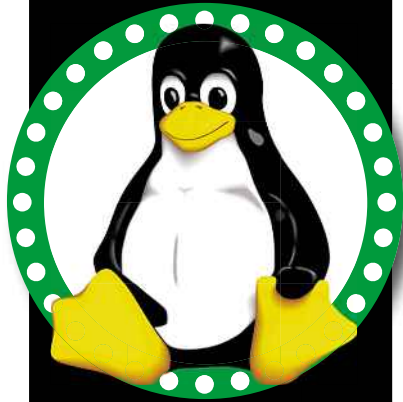
### 5 Pictures Of Food

Personally, we quite enjoy seeing dishes our friends and family have made, or things they've eaten in restaurants. Even though some people find it annoying, it's just one of those things that you have to accept about social media. Doing it in the real world, however, is a complete no-no. For some reason, people find it unusual when you pull out a photo book and show them page after page of cakes, roast dinners, hamburgers and cocktails. Not that it's ever stopped us trying anyway, of course.



Thankfully the Facebook trend for poking hasn't translated to real life





David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

# Linux

# Happy Birthday GNOME

## GNOME comes of age

**G**NOME is finally legal. It can buy alcohol at a pub, and vote; if it was a person, that is. Yes, the GNOME Project turned 18 years old on August 15th, and to celebrate the GNOME team asked its Twitter followers to speak up about why they love GNOME so much, share their love for it, and display the 'I am GNOME' badge that's currently doing the rounds as their Avatar.

However, there were a smattering of comments that didn't quite live up to the spirit of the birthday celebrations. With remarks such as "sadly, it also becoming senile"; "still an immature jerk who wants everything his way, and gets a hissy fit every time someone disagrees with him"; "the rebel without a cause" and "rebel without a clue" creeping into the feed, it's revealed the sad fact that there are some who feel GNOME isn't what it was once was.

On the other hand, and far more positively, there were many who wished happy birthday to GNOME, and added comments such as "keep rocking Gnome", "here's to many more happy birthdays", and "still my top DE of choice".

GNOME did see something of a slump years ago when GNOME 3 was launched. It had much the same effect on the community as Windows 8 Metro interface had on its users some time later, in that the majority of user absolutely hated it. While it did have some bugs and issues with

performance, I rather warmed to it – and in the years since GNOME 3's release it has greatly improved over time to become a quite powerful and impressive desktop environment.

It probably didn't help matters that two of the most popular Linux distros, Ubuntu and Mint, moved away from GNOME in favour of Unity and Cinnamon. Add to that, that

3, with the far more simplistic look and feel (and thus better compatibility with the majority of machines out there), or do you much prefer the more modern GNOME 3.x with its almost tablet look and feel?

And before I sign off: if you're not a GNOME user, or you used to be and haven't touched it for a while, then how about taking a step back

“ There were comments that didn't live up to the spirit of the birthday ”

MATE isn't really regarded as GNOME, despite using the GNOME 2 codebase and being forked from it, and you can see why the love affair has faded.

With regards to the negative comments, though: you'll always come across those who simply want to infect everyone else with their negativity, don't you..? It's one of the basic laws of the internet.

## Are You A GNOME?

It's interesting that an open source project such as this can reach such a lofty age, and still manage to pass the majority of users by without much regard. Surely there must be some GNOME users still out there? With that in mind then, then, I'll ask you: how many of you are true GNOME users? Do you still use the earlier versions, pre-GNOME

and installing it? Go on give it another go, even just for nostalgia's sake.

Either way, what are your thoughts on GNOME? Please write in and let us know your like and dislikes. Until next week then, folks.

▼ Are you still a GNOME? Let us know, and why



I am **GNOME**



# Amiga30UK Part 2

## Sven Harvey visits the UK 30th anniversary event

It was approaching midday at the Peterborough Marriot hotel, where Amiga30 UK was taking place on Sunday 2nd August, when the attendees began assembling in the foyer area outside of the main room to register and pick up their ID lanyards. The lanyards also revealed a giveaway, in the form of a download link and license key to enable visitors to get a free copy of *Amiga Forever 2014 Plus* and *C64 Forever 2014 Plus*, courtesy of developers Cloanto.

The packed schedule got underway with a great talk from Tony Miller who ran (and thus was the SysOp of) the 01 For Amiga bulletin board (or BBS), which was the big (for its time) online community for Amiga users. BBSs were one of the forerunners of the internet as we know it today and this one included a file repository for a huge number of public domain programs. It was great to hear the story behind it, including the rescuing of Winchester disks (that's hard disks to most these days) to host the files!

The second brief talk was from prominent YouTubers Dan Wood and Ravi Abbot, who then played a intro video they had created. During the event the pair also recorded many interviews, which are on their YouTube accounts (see box out). This was then followed up by a preview of *Viva Amiga*, the documentary video that should be being released in early 2016.

The next talk was the one I personally was most looking forward to, and brought David Pleasance the stage. David worked for Commodore in multiple roles – but is probably most famous for being the head of the team

responsible for machine bundles such as the massively successful Amiga 500 Batman Pack in 1989 – and ended up as the Joint Managing Director of Commodore UK (with Colin Proudfoot, who gave a presentation at the corresponding USA Amiga 30 event), which attempted to buy out Commodore International and make it a UK company.

David's presentation covered his initial interactions with Steve Franklin, through to dealing with Mehdi Ali and the story of the failed management buy-out.

We were also very lucky to also have Dawn Levack at the event, who was the head of marketing at Commodore UK for a crucial period that included the creation of the company's most successful bundles, and who was responsible for some oft-remembered marketing – including the infamous "To be this good will take Sega ages" billboard outside Sega's UK headquarters!

David was followed by a man who could be thought of as his contemporary counterpart: Trevor Dickinson. His efforts (and, perhaps, mild insanity) have resulted in new 'next

generation' Amiga hardware being developed in the form of A-EON Technology's AmigaOne X1000 and up and coming AmigaOne X5000. Trevor's presentation outlined events up until the present, as already reported here, but he went on to tell us that the first X5000 machines should be going out to customers in September/October of this year.

Hyperion were up next with an intriguing video showing the growth of the code that manifests itself as the AmigaOS. It clearly demonstrated that the amount of work that has gone into the AmigaOS since AmigaOS 4 was started is larger than the entire workload undertaken previously on AmigaOS up till 3.9.

The day wasn't over and there were more talks, dinner and music to come!



### Links

**Amiga30UK YouTube:** [goo.gl/mt1EvW](http://goo.gl/mt1EvW)

**Amiga30UK Livestream:** [goo.gl/1t06eV](http://goo.gl/1t06eV)

#### Ravi Abbott interviews:

Dawn Levack (Commodore UK Marketing): [goo.gl/p0CKIM](http://goo.gl/p0CKIM)

Bjørn Lynne (Musician): [goo.gl/Sih8RV](http://goo.gl/Sih8RV)

Mike Montgommery (Bitmap Brothers): [goo.gl/JHWzlk](http://goo.gl/JHWzlk)

#### Dan Wood interviews:

David Pleasance (Joint MD Commodore UK): [goo.gl/4wZBeX](http://goo.gl/4wZBeX)

**Colin Proudfoot at Amiga 30 (USA):** [goo.gl/G8dpXA](http://goo.gl/G8dpXA)



Sven Harvey has been our Amiga specialist for over 16 years, drawing on his 25 years retailing computer and video games and even longer writing about them

# Amiga





Ian McGurran is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

# Mobile

# On The Edge

**Ian McGurran looks at Samsung's latest**

**A**s sure as night follows day, and team doctors attend to 'injured' footballers, Samsung's big announcements aren't purely kept for the release of its latest Galaxy S devices. Usually, around six months after, we get what is essentially the same phone with a case of gigantism, the addition of a digitiser pen, and a spec bump. They call it the Galaxy Note, and the version is one less than whatever the year's flagship S is. So, predictably, following 2014's Galaxy Note 4, and this year's Galaxy S6, we got news the Galaxy Note 5. Okay, well, actually... it's not quite as simple as that this year.

Those of you with an interest in ludicrously powerful handheld computers will have recalled that, like Apple in 2014, Samsung's flagship 2015 handset was released in two versions: the Galaxy S6 and the Galaxy S6 Edge. Unlike Apple's devices, which differed in size, both of the Galaxy S6 devices were much the same, with the exception of the S6 Edge's rather luxurious (in looks and price) curved OLED screen. It was one of the first mainstream phones to feature one.

So, for the inevitable late 2015 Note-class release, industry commentators assumed that the same may happen again – essentially both devices made larger and given a bump and a pen, or even that the Note 5 would be a cross between 2014's Note Edge and the S6 Edge – a larger, pen equipped device with a curved screen.

So, which of these happened? Well, surprisingly, neither. In fact what was

revealed was, many have claimed, a backward step for Samsung. There were indeed two handsets, but they were the Galaxy Note 5 (no surprise) and the Galaxy S6 Edge Plus (surprise); so let's take a look at the Galaxy S6 Edge Plus first.

You might think the S6 Edge Plus is to the S6 Edge what the iPhone 6 Plus is to the iPhone 6. And, well... you'd be spot on. Just as the iPhone brethren share everything under the hood, the S6 Edge Plus is also 90% the very same as the S6, the exceptions being its larger 5.7" screen (with the same QHD resolution), a bigger 3,000mAh battery and more RAM. There's no S-Pen, though, and the storage is capped at 64GB, down from the S6's maximum 128GB. Odd for a phone that can't be expanded with MicroSD cards.

Surely, though, if the S6 Edge Plus was a bit of an unexpected let down, the Note series could be relied on to boost the specs as it always does? Well, it does have a similar large 5.7" QHD screen (minus the curve) and its Exynos 7420 2.1GHz quad core and 1.5GHz quad core chipset represent a nice bump in processing power compared to the Note 4, matching the S6 range. Like the S6 Edge Plus, its RAM also gets another 1GB added, taking it to a very healthy 4GB in total and giving Android 5.1.1 plenty of room to stretch its legs.

So with the difficult-to-keep-typing Galaxy S6 Edge Plus maybe not quite as exciting as it could have been, most attention fell on the availability of the Note 5, the latest in the stalwart business range. Sadly, it seems the Note update may not be

coming to the UK this time round. Indeed, there are rumours it may not even make it out of South Korea, and that we could be seeing the end of one of mobile technology's most popular (and, arguably groundbreaking) ranges. No Note, no Phablet.

Samsung's recent sales issues may have led to a drive to consolidate its range. Many would argue, though, that its cull should start with the myriad of poorly specified budget devices rather than its business flagship. A device that's just starting to find favour in the enterprise world.

If this is the end of the Note, then it's been fun. It's a success that shouldn't have been, the first example of what is now almost the norm in terms of smartphone form factors. If many naysayers had been correct, the Note would have come and gone in months like Samsung's later attempt at breaking similar ground with the Galaxy Mega. But the Note was arguably the first mobile equivalent of the luxury supercar, with no expense spared for those that wanted it. If it's never to return, it certainly left a big mark.





# Accelerated Phun Unit

Andrew Unsworth makes amends for letting a new wallet-friendly AMD chip pass him by

Something that slipped my attention a few weeks back is AMD's latest processor, the A8-7670K, which occupies the upper mid-range in AMD's accelerated processing unit (APU) lineup ([tinyurl.com/pbgd8oy](http://tinyurl.com/pbgd8oy)). These processors are designed to provide budget-conscious system-builders with processors that are more than able to support common tasks such as web browsing, producing business documents, watching films and so on. The processors have multiple cores and a novel architecture that has the chip's processor and graphics cores working together to enhance performance. Pairing one of AMD's A-series APUs with an SSD is a great way to build a snappy, responsive system with enough grunt to keep your family happy.

The A8-7670K is part of a refresh of AMD's Kaveri chips, and this new series of chips is dubbed Godavari. The A8-7670K has four processor cores and runs at a stock clock speed of 3.6GHz, with a 3.9GHz boost speed when thermal conditions allow for it. However, the K in the chip's name signifies that you can

overclock it, which means the A8-7670K could be a great choice if you're looking for a relatively inexpensive chip that you can overclock.

AMD's APUs have always had great graphics performance, and although the on-chip graphics processors won't replace a good graphics card for high-end gaming, they're certainly good enough for casual gaming and low-end 3D gaming. The A8-7670K has a built-in R7-class graphics processor, and AMD claims it's good enough for gamers to enjoy smooth Full HD resolutions in many games, although experience with past A-series chips tells me you'll have to tone down the quality settings on 3D titles.

Kaveri and Godavari chips work with FM2+ motherboards, which are some of the best-value motherboards you'll find, with price starting from just over £30. The A8-7670K costs around £80, so if you're looking to build a bargain system then you should give it some serious consideration.

## Control Your Remotes

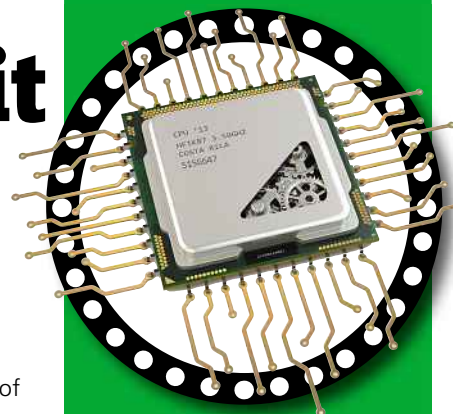
Ever wanted to reclaim control of your TV? You should check

out One For All's latest crop of replacement remote controls. We all have that one person in our households who hogs the remote control and subjects the rest of us to such televisual treats as soap operas, never ending competitive cooking competitions and courtroom-based reality TV – but now you no longer need to suffer. Simply go to One For All's website ([tinyurl.com/ppm2vnh](http://tinyurl.com/ppm2vnh)) and choose the replacement remote control for your TV.

One For All says that its remote controls are 100% compatible with the TVs they're designed to support; so, should you require a Sony TV remote control it should work with your Sony TV without any problems. According to One For All, the remote controls should also work straight out of the box (with the addition of batteries, of course) with absolutely no setup required on your part. The rebellion starts here, if you're brave enough.

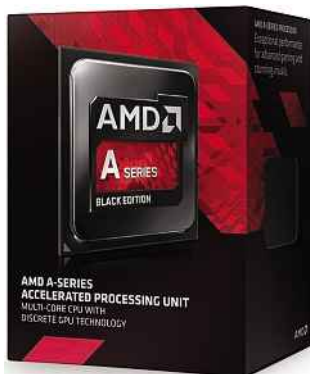
Of course, you may just want a replacement for a busted remote control...

▼ No more arguing over the remote control?



Andrew Unsworth has been writing about technology for several years, he's handy with a spanner, and his handshaking skills are second to none

# Hardware







Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

# Gaming

## Highway To HAL

*A battle of wits between human and machine takes place on a lonely space station in the superb-looking indie game, Event[0].*

This week, Ryan takes a look at the eerie sci-fi adventure *Event[0]*, and checks out World Of Warcraft's subscriber base decline over the past six months...

### Plug & Play

Some of the most promising-looking games on the horizon are set in the chilly vacuum of space. *No Man's Sky*, Hello Games' galactic exploration sim, aims to create an entire procedurally-generated universe of living, breathing planets. Then there's *Adrift*, the dizzying first-person survival game where you're thrown into the midst of a crumbling space station in Earth's upper orbit.

Its first-person perspective immerses the player in a quite eerie zero-gravity environment, where debris-strewn station exteriors give way to awe-inspiring space vistas as you search for oxygen and other items that will help keep you alive for a few more precious moments.

*Adrift*'s creators, Adam Orth and Omar Aziz, have cited Stanley Kubrick's seminal *2001: A Space Odyssey* as an inspiration when coming up with their game's sober sci-fi look and feel, from the uncluttered, clinical lines of its space station to the constant sense of isolation. Kubrick's sci-fi classic has clearly also had an impact on *Event[0]*, a game that introduces the player to an increasingly sinister artificially intelligent computer.

*Event[0]*'s action takes place in an experimental space craft called the Nautilus, floating thousands of miles from home and seemingly deserted. Your only companion is a the ship's HAL-like computer, which talks at length about someone called Anele but won't, worryingly, explain to you exactly what happened to her.

Essentially, *Event[0]* is a mixture of first-person exploration game and text adventure, where you interact with the computer by typing questions or requests into the terminals you'll find dotted around the craft. What's so intriguing about the game is just how convincingly real the computer's responses are; like *2001: A Space Odyssey*, *Event[0]* depicts an increasingly strained relationship between human and machine. The Nautilus's computer seems intent on keeping you in the dark about exactly what's happened in the immediate past, and, more spookily still, seems desperate to keep you around as a companion. "You are the only person I can talk to," the computer says when you ask it to open an external door. The aim of *Event[0]*, it seems, is to find out what happened aboard the ship without hurting the computer's feelings.

For a game which began as a student project, *Event[0]* looks like a remarkably polished and assured piece of work. What it lacks in fancy textures and lighting effects it more than makes up for in its layout and gnawing, low-key tension. What happened aboard the Nautilus? What dreadful secret is its neurotic computer hiding? We're looking forward to getting some answers when *Event[0]* comes out next year. For now, you can find out more at [event0game.com](http://event0game.com).

### Online

A decade's a long time, particularly in the fast-moving world of videogames. But where other MMOs and even the companies behind them have risen and fallen over the past 10 years, *World Of Warcraft* has remained evergreen, retaining a user base in the millions even in the face of newer, flashier diversions from rival studios. And yet even a game lavished with as much funding and fan support as *Warcraft* has some kind of shelf life, and its recent subscriber figures might suggest that this most resilient of MMOs is finally succumbing to the ravages of time.

As expected, the 2014 expansion *Warlords Of Draenor*





▲ Just six months after the release of *World Of Warcraft*'s last expansion, the MMORPG's user base has fallen from 10m to 5.6m. The next expansion, *Legion*, may help to stem the flow

saw *Warcraft*'s user base rapidly spike from around 7.1 million to 10 million – essentially returning it to its standing in 2012 following the release of the previous expansion, *Mists Of Pandaria*. In previous years, *Warcraft*'s numbers fell slowly in each subsequent quarter as players gradually monstered their way through new content, but *Warlords Of Draenor* has seen a far more pronounced decline: in the six months since the expansion launched in late 2014, *Warcraft*'s subscribers fell from 10 million to 5.6 million.

While that's still a healthy figure, it still represents a 10-year low for Blizzard's RPG behemoth; back in 2005, *World Of Warcraft* was only one year old and still making its upward climb which wouldn't reach its peak until

2010, when its subscriber base topped out at a staggering 12 million. Blizzard still has plans for *Warcraft*'s future, ageing though the MMO is.

At Gamescom, the firm announced *Legion*, *Warcraft*'s sixth expansion. It will – again – raise the level cap and add a range of new dungeons, characters, raids and other content. Thought to be scheduled for release roughly in the middle of 2016, *Legion* marks what will be an accelerated cycle of new content for *Warcraft*, with Blizzard hoping to keep player interest on a more even keel with a more regular diet of new adventures over the coming years.

Even if Blizzard can't maintain *Warcraft*'s already remarkable longevity for another decade, we doubt the company will lose

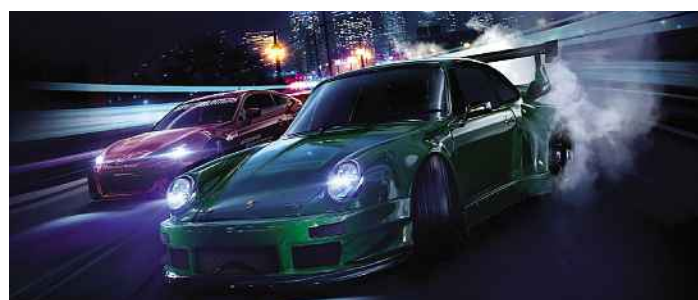
much sleep over it. *Hearthstone: Heroes Of Warcraft*, Blizzard's digital card game spin-off, is bringing in a monthly revenue of more than \$20 million from microtransactions according to a report published by SuperData. According to the research company's figures, that places *Hearthstone* ahead of not only its rival card games, but even a gigantic MOBA like *Dota 2*, which earns around \$18m each month.

Just as Blizzard managed to conquer the MMORPG market with *World Of Warcraft*, so it's captured the digital card-playing zeitgeist with *Hearthstone*, a game that has gone from standing start to market dominance in just a year. With that, *Heroes Of The Storm* catering to the MOBA crowd and multiplayer shooter *Overwatch* waiting in the wings, Blizzard's run of form looks set to continue for many years to come.

## Incoming

EA's penchant for games requiring an internet connection has backfired before; *SimCity* being a prime example. It's repeating the tactic again with *Need For Speed*, though, but that's not gone down well with the game's fan base.

The game's executive producer Marcus Nilsson used a recent *Official Xbox Magazine* interview to make the case that the decision improves the game rather than just being an attempt to curb piracy. He points to the reboot's online tracking system, Autolog, which will "treat your friend's play as if it's part of the narrative experience", and a feature where photos of your exploits can be shared for in-game currency. Will these elements be enough to placate those critics? We'll just have to wait and see when *Need For Speed* appears in November.



▲ Racing reboot *Need For Speed* will require a constant web connection, but executive producer Marcus Nilsson says it's necessary for the game's Autolog tracking system



# AD INDEX

2/3 CCL	23 Laptop Screen
6/7 Morgan	25 TP Link
11 Falcon Computers	29 Modecom
12/13 PC Specialist	91 Sapphire
21 AOC	92 Microdream

To advertise contact :

Joe Teal: +44 (0)20 7907 6689  
Joe\_Teal@dennis.co.uk

## NOTE TO ADVERTISERS

Micro Mart © Dennis Publishing, 30 Cleveland Street, London W1T 4JD. Company registered in England No 1138891. This publication may not be reproduced or transmitted in any form in whole or in part without the written consent of the publisher. Quotations for re-prints or other use of material are available on application.

THE BUSINESS ADVERTISEMENT DISCLOSURE ORDER 1977 (effective from 1st January 1978) requires all advertisements by people who seek to sell goods in the course of a business to make that fact clear. It is the responsibility of the advertiser to comply with the order. Lineage trade ads in Micro Mart carry this \*T symbol. It is an offence for which you may be prosecuted not to advertise the fact that you are a trader.

MICRO MART is published weekly by Dennis Publishing. Subscriptions rates available on request. Micro Mart welcomes the submission of articles and reviews for publication. Please enclose a stamped self addressed envelope; otherwise the return of material cannot be guaranteed. Contributions accepted for publication by Dennis Publishing will be on an all-rights basis. Views or opinions expressed by freelance contributors are not necessarily those of Dennis Publishing. Advertisements and goods/services offered are the sole responsibility of the particular advertiser and Dennis Publishing cannot be held in any way responsible. Whilst every care is taken the publishers cannot be held legally responsible for any errors in articles or advertisements or any resulting unsatisfactory transactions. We will however investigate incidents on a written complaint. © Dennis Publishing 2006. This publication may not be reproduced in or transmitted in any form in whole or in part without the written consent of the publishers. ISSN 956-3881. Blimey.

## 'THE BEST BOOK EVER WRITTEN ON HOW TO GET RICH'

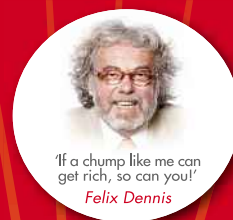
*J. Disorobo, Amazon.com*

**This is a book about getting rich.**

**It's different from any other book on the subject because Felix Dennis made himself rich.**

**Very rich indeed.**

**And now he's going to show you how to do it!**



### THE CRITICS

**'If this book doesn't get you rich, nothing ever will'**

*Mail on Sunday*

**'Well-founded advice based on hard-won experience'**

*Financial Times*

**'Full of honest insights. I strongly recommend this book'**

*Sunday Telegraph*

### THE READERS

**'An inspirational book'**

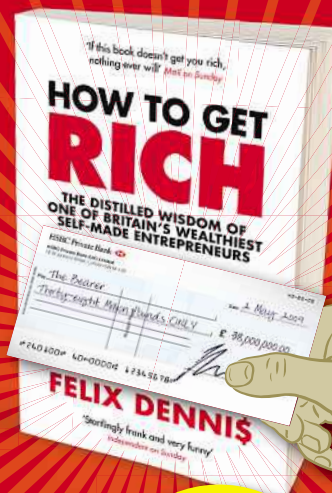
*Alan Bates, Amazon.co.uk*

**'Essential reading. A great work'**

*Tom Rubythorn, Amazon.co.uk*

**'A true masterpiece'**

*'The Wanderer', Amazon.com*



**PAPERBACK EDITION OUT NOW £7.99**

**AVAILABLE NOW AT BORDERS® AND ALL GOOD BOOKSTORES**



[www.randomhouse.co.uk/howtogetrich](http://www.randomhouse.co.uk/howtogetrich)  
[www.felixdennis.com](http://www.felixdennis.com)

**'WISE, FEARLESSLY FRANK AND TRULY INSPIRATIONAL'**

*Mail on Sunday*



# FREE Private Classified Adverts



## ONLINE

Visit our website, register and submit your classified advert at [www.micromart.co.uk](http://www.micromart.co.uk)

*Your advert will not only appear in our magazine, but be live on our website too!*



## POST

Simply fill in the form & post to:

**Emma Corbett, Micro Mart, 30 Cleveland Street, W1T 4JD**

◀ **NEW ADDRESS!**

### Step 1

Write the wording for your advert in the numbered boxes below (one word each box). Maximum 30 words free.

Please complete in BLOCK CAPITAL LETTERS, then proceed to Step 2

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60

30 Words FREE Private Ads Only Trade ads MUST be boxed or reversed	Boxed		Reversed	
	Private	Trade	Private	Trade
	<b>£6.80</b>	<b>£13.60</b>	<b>£8.00</b>	<b>£16.00</b>
£1.70	£8.50	£17.00	£9.70	£19.40
£3.40	£10.20	£20.40	£11.40	£22.80
£5.10	£11.90	£23.80	£13.10	£26.20
£6.80	£13.60	£27.20	£14.80	£29.60
£8.50	£15.30	£30.60	£16.50	£33.00
£10.20	£17.00	£34.00	£18.20	£36.40

### Step 2

Choose a category you would like your advert to appear in and tick the box.

- ☐ Hardware for sale    ☐ Software for sale    ☐ General for sale    ☐ Accessories  
☐ Hardware wanted    ☐ Software wanted    ☐ General wanted

### Step 3

Complete all fields of your personal details and payment method.

Name

Address

Post Code

Landline Telephone No.  Email

If I have more than 30 words, I have enclosed due payment. I am not advertising pirated, pornographic or any other kind of illegal software and my advert is both honest and legitimate. MM reserves the right to refuse or alter adverts at the discretion of the management. MM cannot be held responsible for the condition or quality of goods advertised. Your advert will be processed on receipt and will appear a.s.a.p. subject to space and availability.

Please tick appropriately ☐ Private ☐ Trade

I enclose payment by ☐ Cheque ☐ Postal order

or please Debit my Mastercard/Visa/Amex account No

Expiry Date:

Authorise payment for £



**FAX this completed form to: 0207 907 6066**

**Please Note:** The standard Micro Mart conditions of advertising acceptance apply to all classified advertisements. Cancellations and amendments are not accepted to free ads. The publishers may refuse any advertisements and cannot guarantee insertion into any specific issue. Dennis Publishing will use your information for administration and analysis. We may share your information with carefully selected 3rd parties. We, or they, may send you details of other goods or services which may be of interest to you. The information may be provided by letter, telephone or other reasonable means of communication. If you do not want your details to be shared with carefully selected 3rd parties, please tick here. ☐



# IT

## Essentials

## TO ADVERTISE CALL

**JOE TEAL**  
**0207 907 6689**  
[joe\\_téal@dennis.co.uk](mailto:joe_téal@dennis.co.uk)

# FILCO

The best keyboards in the world.

Available from  
[www.keyboardco.com](http://www.keyboardco.com)  
**0845 205 5555**

**Today's news  
today, not a  
week later**

- Breaking IT news
- News that matters to UK IT decision makers
- Updated throughout the day



IT news as it happens, online now at  
[www.itpro.co.uk](http://www.itpro.co.uk)

# ***www.bit-tech.net***

THE LEADING DESTINATION FOR PC ENTHUSIASTS & Hardcore GAMERS

***bit-tech.net***



# Amber

Transforming young lives



***Amber transforms lives by offering a fresh start to unemployed, homeless young people seeking direction in life.***

***Amber builds confidence, motivation and self-belief.***

***Amber works***



**To donate text AMBR03 to 70070 and the amount  
or go to [www.amberweb.org](http://www.amberweb.org)**

Registered charity number 1051388



**To place an ad in our classifieds, simply fill in the form at [www.micromart.co.uk](http://www.micromart.co.uk) or send your ad by post to Maaya Mistry, Micro Mart, Dennis Publishing, 30 Cleveland Street, W1T 4JD**

## HARDWARE FOR SALE

Have you got any old kit lying around you'd like to get rid of? Fancy making a few pounds while you're at it? Why not advertise in the Micro Mart classifieds? It's easy and it's free, just email what you've got, how much you'd like for it, and your contact details to [micromart-classifieds@gmail.com](mailto:micromart-classifieds@gmail.com), and we'll do the rest. There are thousands of readers out there looking for components every week, and you may have something unwanted they've been searching for – so get in touch and save your kit from going to the tip!

**Dell ULTRASHARP U2913WMT** 29" SUPERWIDE MONITOR FOR SALE. VERY GOOD CONDITION NO SCRATCHES OR DEAD PIXELS, SELLING DUE TO UPGRADE TO 4K! LOVELY IPS SCREEN. Original Box with cables/stand £280. Paypal or cheque.  
**Email:** [llew.lion@googlemail.com](mailto:llew.lion@googlemail.com)

**Acer Aspire 1670 laptop.** No hard disc. Otherwise in excellent condition. In laptop bag. £45.  
**Tel:** David (07901) 994958

**Gigabyte Geforce GTX680.** Model GV-N680D5-2GD-B, 2048MB RAM, PCIe x16, bare card, no box. £200 ono. Collection only from Wokingham RG41.  
**Tel:** Bob Pratt (01189) 781753  
**Email:** [bob@docbobs.com](mailto:bob@docbobs.com)

**2 x 2GB OCZ Gold Series DDR2 RAM.** PC2 8500, (matched pair) P/N OCZ2G10664GK 5-6-6 2.1v Removed from my working machine. £40 the pair incl. reg. post.  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**MOTHERBOARD + RAM + GRAPHIC CARD BUNDLE.** Asus P5QL SE + OCZ 4Gb RAM + 1Gb Quadro PCI-E Graphic Card. SEE SEPARATE ADS FOR DETAIL. From my Windows 8 machine. BUNDLE: £105 Incl. Reg. P&P  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**2 x 2GB OCZ Gold Series DDR2 RAM.** PC2 8500, (matched pair) P/N OCZ2G10664GK 5-6-6 2.1v Removed from my working machine. £40 the pair incl. reg. post.  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**NVidia Quadro 600 GPU.** 1GB DDR3, Dual link DVI-I + Display port. Max. Display at 60Hz + 2560x1600, Direct X 11, Open GL 4.4. The best per watt in its class. Big performance, small form factor, small power consumption. From my working Win8 PC. £32.50 inc Reg. post.  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**Asus P5QL SE + OCZ 4Gb RAM + 1Gb Quadro PCI-E** Graphic Card. SEE SEPARATE ADS FOR DETAIL. Removed from my Windows 8 machine. BUNDLE PRICE £105 Incl. Reg. P&P  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**NVidia Quadro 600 GPU.** 1GB DDR3, Dual link DVI-I + Display port. Max. Display at 60Hz + 2560x1600, Direct X 11, Open GL 4.4. The best graphics performance per watt in its class. Big performance, small form factor, and small power consumption. Removed from my working Win 8 machine. £32.50 incl. Reg. post.  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**Dell XPS12 Ultrabook.** 4th gen i5, 4GB RAM, 128GB SSD 10 point touch 12.5" 1920 x 1080 Display, Backlit US Keyboard, Wireless-AC, Bluetooth, USB3. £395  
**Tel:** Ian (01932) 856971  
**Email:** [a2345@btinternet.com](mailto:a2345@btinternet.com)  
Asus P5QLSE ATX motherboard. LGA 775/Socket T, P43 chipset, DDR2 SDRAM, FSB 1600MHz. I/O Backplate + Driver Disk + User Guide. Rock solid board removed from my working machine. £39.50 to include reg. UK postage.  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**NON ECC LOW DENSITY LAPTOP MEMORY MODULES. DOUBLE SIDED RAM.** Working Laptop pull, Please double check as No returns due to incompatibility. 8GB 2 X 4GB Crucial 204 Pin SODIMM 512Mx64 DDR. CT51264BC1067.M16FD BV1111Z.FS 201106 SU £27.50 the pair incl. Reg. p&p  
**Tel:** Dave (01206) 298773  
**Email:** [ochdgh@aol.com](mailto:ochdgh@aol.com)

**Dell Latitude E5420 i5.** Very fast 2.5, 4GB RAM, 500GB HDD, DVDRW fantastic condition. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for an extra £10. Please call all email for any questions. It has Windows 7 64 bit installed and activated with a genuine certificate of authenticity. NEW £125.  
**Tel:** Dave Thomas (07828) 982930 or (01942) 706571  
**Email:** [davethomas96@aol.com](mailto:davethomas96@aol.com)

**Compaq/HP nc6320 Laptop.** Core 2 Duo 1.8mhz, 512 Ram, 80gb Hard drive DVDRW Win 7 Professional COA. Memory can be upgraded for an extra charge. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next

day for an extra £10. Please call all email for any questions. It has Windows 7 32 bit installed and activated with a genuine certificate of authenticity. Refurbished £60.  
**Tel:** Dave Thomas (07828) 982930 or (01942) 706571  
**Email:** [davethomas96@aol.com](mailto:davethomas96@aol.com)

**Dell D830 laptop.** Core 2 Duo T8300 2.4mhz (very fast) 2gb ram 120GB HDD, DVDRW Genuine Win 7 pro 32-bit activated. Fantastic condition. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for £10. Call/email with questions. Refurbished £80.  
**Tel:** Dave Thomas (07828) 982930 or (01942) 706571  
**Email:** [davethomas96@aol.com](mailto:davethomas96@aol.com)

**Compaq/HP 6910p Laptop.** Core 2 Duo 1.8mhz, 2gb Ram, 160gb Hard drive DVDCDRW Win 7 Professional COA. Cheaper than any on Ebay. Very good battery life. You can collect from Manchester or Portsmouth or I can courier out to you next day for an extra £10. Call or email any questions. It has Win 7 32-bit installed and activated with a genuine COA. Refurbished £60.  
**Tel:** Dave Thomas (07828) 982930 or (01942) 706571  
**Email:** [davethomas96@aol.com](mailto:davethomas96@aol.com)

**Desktop PC.** Zalman T3 case, 3.4Ghz CPU, Asus Motherboard, Seagate 500gb HDD, Samsung Optical drive. 4gb Kingston RAM Wifi & Ethernet, Genuine Windows 7 Ultimate. Collection preferred from Flintshire or willing to discuss options. £150.  
**Tel:** Paul (07900) 796780  
**Email:** [n-peckdd@5kid5.net](mailto:n-peckdd@5kid5.net)

**PC Desktop Ram (DIMM)** Memory. Siemens PC100 - 222- 620 16M x 64 SDRAM. HYS64V16222GU-8 Only £8.  
**Tel:** Gordon (01314) 660205  
**E-mail:** [scobieg09@gmail.com](mailto:scobieg09@gmail.com)



**27" iMac.** 2.9 GHz Intel i5, 1TB HDD, 8GB RAM – late 2012 Model (thin edge) iMac in good condition, running OSX Yosemite. No keyboard or mouse. Supplied in original box. £700.

*Tel: Chris Salter (01707) 880251*

*Email: ChrisSalter@hoarelea.com*

**ANTEC 2800 MIDI-TOWER.**

Black Antec case, Sempron 2800+, Gigabyte m/board, 2GB RAM, 80GB Hard-Drive, DVD-RW, 10/100 Network. Clean install of Windows XP, Office 2007, fully updated & activated, all usual utilities, XP COA on case. £39 (P&P £15).

*Tel: Pat (07710) 348638*

*Email: pat4cars@aol.com*

**HP 88 Inkjet Cartridges** eight time expired boxed HP cartridges £5.

*Tel: Ian (01932) 856971*

*Email: a2345@btinternet.com*

**OPTERON 185 WORKSTATION.**

2.6GHz Dual-Core, Freezer 64, 4GB RAM, 160 + 300GB, CD-RW, DVD-RW, Floppy, network Card, Soundblaster , NVidia , Vista Business, fully updated & activated, with copy of install media & working activation number. £79 (P&P £15).

*Tel: Pat (07710) 348638*

*Email: pat4cars@aol.com*

**WD 500GB external USB HDD.**

Excellent Condition. £20 inc. P&P.

*Tel: Michael Cunnane (01452) 303732*

**KINGSTON 120GB SOLID**

**STATE HARD DRIVE.** For sale 120GB Kingston solid state hard drive model SSDnow V300 2.5" Sata3 - compatible with Sata2. Very fast drive. Perfect condition. Free delivery. PayPal accepted. Price £38.

*Email: geofry@tiscali.co.uk*

**ASUS P5QL-EPU Motherboard**

- 775 Socket - DDR2. Tested and removed from a working environment, comes with I/O Plate. £45 inc Free Courier. Payment via PayPal.

*Email: info@jmcomputing.info*

**Laptop for sale.** Dell Latitude E5420 i5 2.5 ghz, 4GB RAM, 500GB hard drive, DVDRW, built in camera. Genuine Windows 7 64 bit professional. Only £150 plus £12 for next day delivery. Payment via Paypal or cheque or bank transfer, cash. Fantastic condition very fast.

*Tel: Dave Thomas (07828) 982930 or (01942) 706571*

*Email: davethomas96@aol.com*

**Laptop for sale.** HP NC 6400 Core 2 DUO 2.0MHz 3GB ram 80GB HDD, DVDCDRW Fingerprint reader, Fantastic and fast . Windows 7 32-bit professional. Only £60 plus £12 for next day delivery.

*Tel: Dave Thomas (07828) 982930*

*or (01942) 706571*

*Email: davethomas96@aol.com*

Asus Z97 Gryphon Armor Kit. Steel backplate with plastic top and auxilliary fan. Also some minor plastic bits. £20. Email for more details.

*Email: graham\_rocknell@yahoo.co.uk*

**Laptop for sale.** HP Compaq 6910p Core 2 DUO T7300 2.0mhz 3gb ram 80gb hard drive DVDCDRW Fingerprint reader fantastic and fast , Genuine win 7 35 bit professional Only £60 plus £12 for next day delivery. Fantastic condition, very fast.

*Tel: Dave Thomas (07828)*

*982930 or (01942) 706571*

*Email: davethomas96@aol.com*

**PC Desktop Ram (DIMM)**

Memory. 64MB Siemens PC100-322-620 MT8LSDT864AG-10CZ5. £8.

*Tel: Gordon (01314) 660205*

*E-mail: scobieg09@gmail.com*

**WD 3TB internal Hard Drive.**

Excellent Condition, £65 inc P&P.

*Tel: Michael Cunnane (01452) 303732*

**WD Internal SATA 3.5" 2TB**

Hard Drive. Excellent Condition. £37.50 included P&P. Flat screen

monitors. Mainly 15" £20+p&p and 17" £30+p&p but have others on request. When packing I will make sure they have lot of padding to reduce risk of damage. Please email or call me for more information.

*Tel: David (01616) 888119*

*Email: pcmadnessltd@yahoo.co.uk*

**IBM Thinkpad T30 laptop**

for spares or repairs. Excellent condition, but does not bootup. Not sure why. Could be an easy fix or for parts/spares.

£15 plus P&P.

*Tel: Gordon (01314) 660205*

*E-mail: scobieg09@gmail.com*

**Webcam (Trust Spacecam).**

Boxed with CD of installation software and instruction manual. Perfect condition. £10.

*Tel: Gordon (01314) 660205*

*E-mail: scobieg09@gmail.com*

**For Sale: HP Photosmart C4585**

All-in-One multifunction colour printer. Perfect condition. Includes software discs and manual. £20

*Tel: Gordon (01314) 660205*

*E-mail: scobieg09@gmail.com*

**Western Digital Cavier SE**

Desktop Hard Disk Drive 160GB. In Perfect condition. Only £10

*Tel: Gordon (01314) 660205*

*E-mail: scobieg09@gmail.com*

**Netgear DG834N** Rangemax Next Wireless N Modem Router kit. Excellent condition complete with power supply, network cables, telephone cable, ADSL filter and setup CD. £10.

*Tel: David Ewles (01295) 253554*

*Email: david@ewles.gb.com*

Asus A8V motherboard, socket 939. Clips holding CPU cooler broke, CPU overheated & shut down. M/B should be OK and there is 4GB of ram on board. Free, collect only. North Wales.

*Tel: (01286) 678584*

*Email: gw7hav@googlemail.com*

**Toshiba Portage i5 laptop.**

2.5GHz Model R830-13c 4GB RAM, 320GB HDD. Wi-Fi, fingerprint scanner, HDMI ouput. Sold on eBay for over £200; only £150 plus £15 p&p. Bargain. Great condition. Very light.

*Tel: Dave Thomas (07828) 982930*

*or (01942) 706571*

*Email: davethomas96@aol.com*

**Seagate Barraucda 250GB**

**SATA Hard Drive 3.5".** Tested and removed from a working environment. £12 inc Free Courier. Payment via PayPal.

*Email: info@jmcomputing.info*

**LAPTOP HARD DRIVE. 160GB**

SATA 2.5". WESTERN DIGITAL. Model: WD1600BEVT. Fully tested. Perfect working order. Partitioned and formatted NTFS. Free postage. Price £22. Paypal accepted.

*Email: geofry@tiscali.co.uk*

**DESKTOP HARD DRIVE.**

640GB Western Digital 3.5" SATA model WD6400AAKS. Perfect working order. Partitioned and formatted. Only used as back-up drive. Free delivery. Price: £33. PayPal accepted.

*Email: geofry@tiscali.co.uk*

**4x 1 GB DDR2 RAM** (Ocz Nvidia SLI PC2 6400 epp 4-4-4-15)

for Sale. £40.00 for all 4 + Post/Packing. In perfect working order.

*Email: ken.toole1@virginmedia.com*

**Vintage Amstrad PC1512 HD20.**

Colour Monitor 20MB Hard Drive 5.25 Floppy Original Amstrad Disks Manuals spare Keyboard and Mouse. This is a rare fully functioning collectable. £60.

*Tel: (01949) 876235*

*Email: hc4203@gmail.com*

**4x 1GB DDR2 Ram** (OCZ Nvidia SLI PC2 6400 epp 4-4-4-15).

£40.00 for all 4 + Post/Packing. Perfect working order.

*Email: ken.toole1@virginmedia.com*



**Laptop Hard Disk Drive.** Fujitsu. 20GB. Excellent condition: £10.00.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com

**FXF GeForce Nvidia 8800Gts**  
Graphics Card For Sale. £40.00 +  
Post. In perfect working order  
Email: ken.toole1@virginmedia.com

**Corsair Vengeance 16GB**  
**(2x 8GB) DDR3 RAM**  
CMSX16GX3M2A1600C10. Never  
used. Selling due to wrong voltage,  
these are 1.5V and I needed 1.35V.  
Asking £85 inc. postage to the UK.  
Email: fabstock1@gmail.com

**HP Microserver n40l** / windows  
7 Pro / 4GB RAM / 400GB  
drive / MS Office 2003. This HP  
n40l Microserver is in excellent  
condition and comes with  
Windows 7 re-allocated, activated  
& updated Feb 2015. Also installed  
is Minitools Partition Magic,  
MS Office 2003 HP basic, with  
codes/COAs. Buyer may have  
Linux Mint, or a completely bare  
drive. 2 spare drive frames. I have  
the original packing as per HP  
original delivery. So far as I can see,  
this Microserver will take 16GB  
memory and up to five drives.  
See it working before buying, (by  
arrangement). No refund under  
any circumstances. Collect from  
Harrogate, North Yorkshire. £140.  
Cash on collection. Delivery  
might cost £8 via Hermes, maybe  
much more to Highlands/Islands.  
Payment by Cheque OK subject to  
clearing, Paypal at £25 additional  
(to cover their fees).  
Tel: (07794) 528857  
Email: it\_central@ntlworld.com

**CD Optical Drive** for installation  
in desktop PC Only £10.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com

**Used Asus Wireless Router** for sale.  
Dual-band 4 x GB Ethernet Wi-Fi  
RT-N66U N-900. £65.00 O.V.N.O.  
Selling cause I have no need for it  
since upgrade to BT Home Hub 5.  
Email: beme12355@googlemail.com

Intel Core 2 Duo E4400 2.0GHz £10,  
Intel P4 630 3.0GHz £7, Intel Celeron  
M 350 1.3GHz £5, Intel Celeron  
Mobile Dual core T1500 1.866Ghz  
£6, Intel Pentium 4 630 HT 3.0Ghz  
2MB cache £8, AMD Athlon 64 3200  
£5 Athlon 64 3500 £6 Athlon 64 3200  
Dual core £10 postage £2.  
Tel: Jeremy Gill (02089) 430683  
Email: arthur.pewty1@virgin.net

**SKY PLUS and SKY PLUS HD**  
**REMOTES.** Original £7.50 +  
P&P please email or call me for  
more information.  
Tel: David (01616) 888119 Email:  
pcmadnessltd@yahoo.co.uk

**US Robotics External 56K**  
**Message Modem.** Includes V.90  
56K Standard X2 Technology.  
Boxed and complete. Perfect.  
£25 + p&p.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com

**2 x 2GB DDR3 1600 MHz RAM.**  
Recently taken from a 2012 mac  
mini. As new £25.  
Email amstereofan@gmail.com

**Custom Built modified**  
**watercooled gaming desktop.**  
i5 4670K, R9 280X, Silverstone  
RV-01 USB3, 1000W PSU:  
parachord sleeving, Z87M OC  
Formula, 8GB Kingston Fury  
1866MHz, 180mm and 120mm  
Radiator. Yellow and Black colour  
scheme! No Storage. Email for  
pics and info. Buyer collect:  
Gloucestershire. £800 ono.  
Tel: Adam (07426) 874117 Email:  
flaming\_monkey95@hotmail.co.uk

**CPU sale.** Intel Core 2 Duo  
E4400 2.0GHz £10, Intel  
Pentium 4 630 3.0GHz £7, Intel  
Celeron M 350 1.3GHz £5, Intel  
Celeron Mobile Dual core T1500  
1.866Ghz £6, Intel Pentium 4  
630 HT 3.0Ghz 2MB cache £8,  
AMD Athlon 64 3200 £5 Athlon  
64 3500 £6 Athlon 64 3200 Dual  
core £10 postage £2.  
Tel: Jeremy Gill (02089) 430683  
Email: arthur.pewty1@virgin.net

**Kingston HyperX 2x2GB**  
**DDR2 1066MHz RAM.** Tested  
and removed from a working  
environment. £45 inc Free  
Courier. Payment via PayPal.  
Email: info@jmcomputing.info  
**2x 512MB PC3200 DDR400.** Two  
sticks were removed from working  
system. £5, plus £1 P&P.  
Tel: Alan (02084) 202322  
Email: alan@asandco.co.uk  
**DDR2 memory sale.**  
2 x Nanua PC2 3700 256MB £6 pair,  
2 x HP PC2 4200 256MB £7 pair,  
4 x HP PC2 4200 512MB £10 pair  
or £18 for four.  
Tel: Jeremy Gill (02089) 430683  
Email: arthur.pewty1@virgin.net

**Asus M2N2-SLI Deluxe**  
**motherboard bundle.** With AMD  
Athlon 64 4000 CPU, 4GB of  
Corsair RAM plus fan, backplate,  
manual and driver CD. £40  
Email: david.white38@ntlworld.com

**IBM/LENOVO SFF BASEUNIT.**  
P4/ 2.8 H-T, 2GB RAM, 40GB Hard  
Drive, CD-Rom, 10/100 Network,  
sound, USB, Clean install XP-pro,  
fully updated, Office Suite, Anti-  
Virus, & all usual utilities, COA  
Licence Sticker & Install media, £25  
Tel: Pat (07710) 348638  
Email: pat4cars@aol.com

**FUJITSU-SIEMENS**  
**MINITOWER.** Pentium D 2.8  
Dual-Core, 2GB RAM, 80GB  
Hard Drive, DVD-RW, Gigabit  
network, sound, Clean Install  
XP-pro, fully updated, Office  
suite, Anti-Virus & all usual  
Utilities, Legal COA sticker &  
System Image. £35  
Tel: Pat (07710) 348638  
Email: pat4cars@aol.com

**DELL OPTIPLEX GX240 SFF.**  
**P4/1.6,** 20GB hard Drive, 768MB  
RAM, CD-Rom, 10/100 network,  
Sound, Front USB, Clean install  
XP-pro, fully updated, works  
OK but slow by modern  
standards, £15.  
Tel: Pat (07710) 348638  
Email: pat4cars@aol.com

**56kb Fax Modem External.** £10.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com  
**LG Flatron W2246S 22" monitor**  
with power and VGA leads.  
No dead pixels in very good  
condition. £50 Buyer Collects  
(Verwood, Dorset)  
Tel: (01202) 826057 Email:  
geoffandcynth@themailspot.com

**2x 1GB PC2100-648.** These two  
matched sticks were removed  
from one of my redundant  
systems. Plus one PC2700  
(DDR 333Mhz) and one 512Mb  
PC3200 DDR400 stick. All for £5  
plus £2 P&P.  
Tel: Alan (02084) 202322  
Email: alan@asandco.co.uk

**Very rare Viking IBM 16MB**  
**Dram Card** (15109 66G5109)  
for Compaq, IBM Thinkpad, Etc  
Laptop Only £20  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com

**TP-Link 54Mbps 4-port Wireless**  
**G Router.** Perfect, boxed. Model:  
TL-WR340G. £20 plus postage.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com

**Intel Core 2 Duo E4600 3GHz**  
775 Socket Processor. Tested  
and removed from a working  
environment. £10 inc Free  
Courier. Payment via PayPal.  
Email: info@jmcomputing.info

**Addon Wireless LAN USB 2.0**  
**54Mbps 802.11g Adaptor.**  
Boxed w/ manual and software: £9.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com

**CD Stomper CD/DVD Labelling**  
**System:** Software, Labels and Label  
Applicator. Boxed. Unused. £9.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com

**DIR-615 Wireless N Router.**  
Boxed, brand new. £30.  
Tel: Gordon (01314) 660205  
E-mail: scobie09@gmail.com



### Laptop DDR2 memory sale.

2 Corsair Value Select 533mhz  
1GB £18 pair, 2 Hynix 800mhz  
2GB £26 pair, 2 Generic 533mhz  
1GB £15 pair, 1 Generic 800mhz  
1GB £10, 1 Nanua 666mhz 1GB  
£, 1 Samsung 666mhz 1GB £8.  
Postage included

Tel: *Jeremy Gill (02089) 430683*  
Email: *arthur.pewty1@virgin.net*

### 2x 120GB Maxtor DiamondPlus 9

Drives plus 1x 80GB DiamondPlus  
10. Can be supplied with 2x plug-in  
caddies. Reasonable offers please.

Tel: *Alan (02084) 202322*

Email: *alan@asandco.co.uk*

### HP Elitebook 8760w i7 2820QM @

2.2GHz 32GB RAM 750GB HDD  
Quadro 4000M GPU. Only 2 small  
marks on whole machine. Cost

£3500 when new. £900 ONO

Tel: *(07772) 926632*

Email: *stedaley19@gmail.com*

### WD 2TB desktop HDD. Formatted

ready for an OS. Runs very nicely.  
New laptop means desktop items  
must go! £40 inc. tracked postage.

Tel: *(01619) 501218*

Email: *jmbest2@sky.com*

### Toshiba C500D-B-11 laptop. Almost

new cost £279 will accept £150ono

Tel: *(01217) 535324*

### Intel 3930K processor. Used, but

not overclocked. No box or fan.  
£220 ono. Will ship to UK address.

Tel: *Tim (01623) 624509*

Email *tim.stirland@btinternet.com*.

### Amstrad PcW 9256 in good

working order with software. Offers.

Tel: *John Adams (02088) 641202*

Email: *meeching@uwclub.net*

### Asus P8Z68-v LX socket 1155

motherboard. Original box 1/0  
cover user guide driver disk fitted  
core i3 2100 CPU 3-1GHz and 8GB  
PC1300 memory. No fan. Working  
fast and fine. £125 + free postage.

Tel: *(01619) 501218*

Email: *jmbest2@sky.com*

## HARDWARE WANTED

**Trying to breathe life back into an old machine? Why not submit a wanted ad and see if any of the thousands of computer enthusiasts who read the magazine each week have what you're looking for?**

WANTED: PC Tower case (beige colour if possible) to rehome an Amiga A1200 vintage computer. The Amiga motherboard is H 410mm x L 190mm (H 16" x L 7.5"). PSU not an issue but if available 250 watt more than enough.

Tel: *Bill (07742) 061569 or*

*(02641) 769503.*

### WANTED: Fractal Design Define

XL full tower case. R1 (original version) in black.

Tel: *(01670) 860146*

Email: *mm@tectron.co.uk*

### WANTED: Working Dot Matrix Printer in Good Condition.

Thanks!

Email: *printer.20.odayly@*

*spamgourmet.com*

### WANTED: Acorn computer

either an A5000 or A7000. Also book on teaching yourself binary.

Tel: *(07817) 861011*

Email: *Johnhaviland73@gmail.com*

## SOFTWARE FOR SALE

**Do you have old software that you simply don't use? Why not advertise with us and see if anyone else can make use of it – you may well be surprised to find that someone is looking for it!**

Adobe Photoshop Elements and Premiere Elements 12 Full Version - Windows/Mac. Original Boxed CD with unused product key. £47.50

Tel: *Ian (01932) 856971*

Email: *a2345@btinternet.com*

PCB design software 127 layers, schematic entry, PCB entry, PCB

to Gerber file converter, output to printer. £9.99

Tel: *Nigel Wright (07967) 527693*

Email: *cresswellavenue@talktalk.net*

### Cyberlink PowerDVD 12

Standard. Runs under Windows 8, 7, Vista or XP. Original CD with unused product key £7.50

Tel: *Ian (01932) 856971*

Email: *a2345@btinternet.com*

Microsoft Office 2013. Original Software only £100.

Tel: *Gordon (01314) 660205*

E-mail: *scobieg09@gmail.com*

### Sim City 2000. Boxed and

original. Classic gaming. £15.

Tel: *Gordon (01314) 660205*

E-mail: *scobieg09@gmail.com*

Norton Family Premier 2.0. Runs under Windows 8, 7, Vista or XP, Original Symantec unused product key £15.

Tel: *Ian (01932) 856971*

Email: *a2345@btinternet.com*

Nuance Omnipage 18. OCR for Windows 8, 7, Vista or XP, Original CD with unused product key £25.

Tel: *Ian (01932) 856971*

Email: *a2345@btinternet.com*

Acronis True Image Home 2012. Bootable CD. Application runs under Windows 8, 7, Vista or XP. Original Acronis CD with unused product key £5.

Tel: *Ian (01932) 856971*

Email: *a2345@btinternet.com*

## SOFTWARE WANTED

Wanted: I have a BCL 2.4g Wireless Gaming Mouse, Model: RF0P77 (3v 7ma) but no Drivers. Can someone help with a copy of the Original Drivers for this Wireless Mouse>??  
*cliffordevans603@btinternet.com*

Wanted: Driver disc for Toshiba L30-11D PSL33E laptop. Laptop useless without drivers but only worth £40, so cannot pay a lot.

Tel: *John Udall (01384) 824494*

Email: *john.udall@blueyonder.co.uk*

## IMPORTANT BUYING ADVICE

**We work very hard to police our classified ads, and make them as secure as possible. However, please do your bit too and use the following guidelines:**

- **Never - NEVER** - pay by bank transfer or post out cash, unless you know the trader already, or are sure it is okay to do so. Pay by cheque, Paypal, Nochex etc wherever possible.

- Be wary of anyone who insists on you paying by the above methods if in doubt, get us to check them out by mailing [editorial@micromart.co.uk](mailto:editorial@micromart.co.uk)

- Keep copies of all correspondence

- When sending out goods, at the least obtain a certificate of posting from the Post Office

**If you are in any doubt, feel free to send us a mail via [editorial@micromart.co.uk](mailto:editorial@micromart.co.uk).**

**Every year, thousands of successful transactions take place through our classifieds, and that's just how we like it.**

**Help us help you keep them one of the safest and most secure places to buy and sell computer kit.**



# ASK AARON



**Meet Aaron Birch.** He's here to help you with any general upgrading, software and system building problems. He's got advice aplenty, and you're very much welcome to it!

Send your questions to:  
Aaron Birch  
Micro Mart  
Dennis Publishing  
30 Cleveland Street  
London  
W1T 4JD

Contact Aaron by email at:  
aaron@micromart.co.uk

Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

*Aaron*

## Missing GWX

Now that Windows 10 is available, I'm keen to give the new version a go. One thing that confused me about the upgrade is how to actually get it. I was under the belief that the update would be made available for free, and we'd have the option to simply upgrade when it was ready. This seems to be what other people do, but as far as I can see, I don't have the option. I've not had any contact, or emails, and nothing in Windows 8 seems to suggest how I proceed.

I've looked online, and have found that I'm supposed to have some kind of application that lets me upgrade to Windows 10. I don't have this, and I'm not sure where to get it. I've looked in the Windows store, and can't find it there, so am at a bit of a loss.

I'm hoping you can help with this. I'd like to upgrade and give Windows 10 a go. I'm running Windows 8, and have a Dell laptop.

**Tim**

*It would appear as though you're having problems preventing the Windows 10 upgrade app from being pushed out to your PC. As it's an application, you'd be forgiven for thinking you can download it from the Windows store, but this isn't the case. Instead, the app is pushed out to you via Windows Update. If you have problems with your Windows updates, it's common for the app to be absent.*

*The usual fix for this issue is to ensure that you're up to date, so run Windows Update and download and install all relevant files. This includes any service packs, such as Windows 7 SP1 and Windows 8.1. You should also check to see if any previous updates have failed. You can do this by going to Control Panel and selecting View Update History in the Windows Update section found in System And Security.*

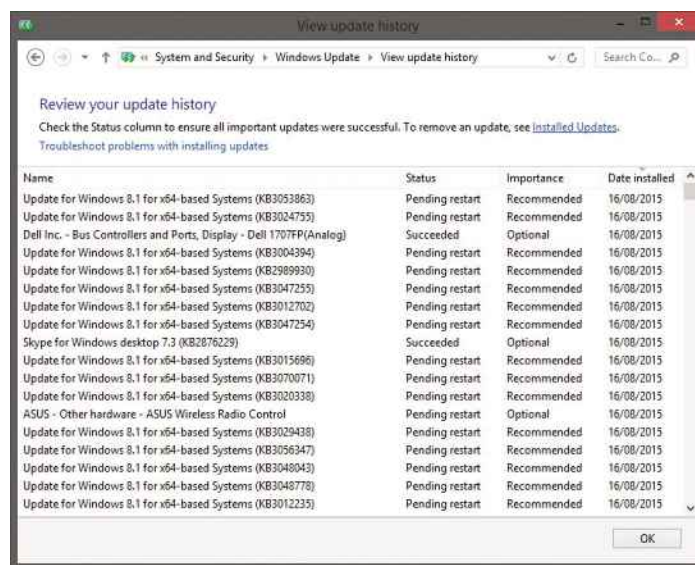
Once you've done this, reboot your PC. If all has gone well, you should see the Windows 10 upgrade icon on the task bar. Click this, and proceed as instructed. The app can also be missing if you're running a Windows install that's not genuine or if, for some reason, your PC isn't compatible with Windows 10. You should also be running IE11. Enterprise OS versions are not supported by this upgrade process, so the app won't appear. It'll also not appear if your PC is on a domain or a network.

If this update doesn't work, you may need to take further steps. First, we'd recommend trying out Microsoft's own fixit tool. You can grab this tool

from [bit.ly/1JZCoDW](http://bit.ly/1JZCoDW); run it and follow the instructions, If you still don't have the icon, proceed to the next steps.

The first of these will be to check that the icon isn't actually hidden. To do this, right-click the task bar clock and select Customize Notification Icons. Look for the GWX Get Windows 10 icon. If it's listed, it's probably set to be hidden, so set it to show up.

Should that not work, next check to see if the upgrade app is on your system by going to its folder in Explorer. You'll find this at C:\Windows\System32\GWX. If the GWX folder isn't present, then it's not installed, so you'll need to focus on actually getting hold of the app.



▲ Check your Windows update history for problems if you don't have the Windows 10 update application



▲ Microsoft has a GWX app fix tool that could help, and it's easy to use



A widely used fix for the missing install is to manually install the required Windows update. This will change depending on your current version of Windows, but I'll include the links here. Simply download and install the corresponding update, and when you reboot, you should see the app appear. This is especially useful if you've run auto update, but the update required failed, or if you've opted to not download optional, recommended updates (which this actually is). The update in question is KB3035583, and the links are as follows, shortened to make it easier.

Windows 7 32-bit ([bit.ly/1JbHHk6](http://bit.ly/1JbHHk6))  
Windows 7 64-bit ([bit.ly/1AKm47C](http://bit.ly/1AKm47C))  
Windows 8.1 32-bit ([bit.ly/1Qr1S1B](http://bit.ly/1Qr1S1B))  
Windows 8.1 64-bit ([bit.ly/1LABmMC](http://bit.ly/1LABmMC))

If you already have this update, and it's not working, make sure you uninstall it via Control Panel before running one of these again.

The final suggestion we have to resolve this situation is to do away with the Windows update app altogether and instead upgrade using the Windows 10 Media Creation Tool. As we outlined last week, this can be used to create your own installs and media – including USB and disc.

It's a local install, so doesn't need the app at all, thus solving your problems in a couple of relatively simple steps. Just make sure you choose the upgrade option, otherwise you'll need an actual Windows 10 key, which you won't have. The upgrade doesn't require a key. You can get the tool from [bit.ly/1KwZCCq](http://bit.ly/1KwZCCq).



▲ The Windows 10 Media Creation Tool lets you download the Windows 10 image and make your own install media, no GWX app needed

Follow the instructions there, and ensure you pick the right Windows versions (Home/Pro). This should then let you install with no problems.

## Uphill Install

I'm trying to install Windows 10 on my laptop using the Windows 10 flag icon, and all seems to go okay. To this point I've been given a reservation, downloaded the files needed, and am apparently ready to install. I click the continue button and the installer says it's getting things ready, but after a minute or so, it just quits, and nothing else happens.

I've tried running the install several times, but the same thing happens each time. I do recall getting a blue screen of some sort on my first attempt, which was a couple of days ago, but I don't remember what the error was I'm afraid. I have been into my Windows Update, and it shows an error number – C1900101-4000D. It says the last update failed.

I hope you can help solve this problem, as I would like to make use of the free upgrade to Windows 10. I'm running Windows 8.1.

**Wesley**

The blue screen you encountered when you first attempted to install Windows 10 is probably the most important part of this issue, so it's a shame you can't remember the actual error message. However, I've heard similar issues to this, so could still help.

Amidst the various mails I've had regarding Windows 10, I've seen the error C1900101-4000D before. It would certainly seem to be related to some sort of update issue, although the error refers

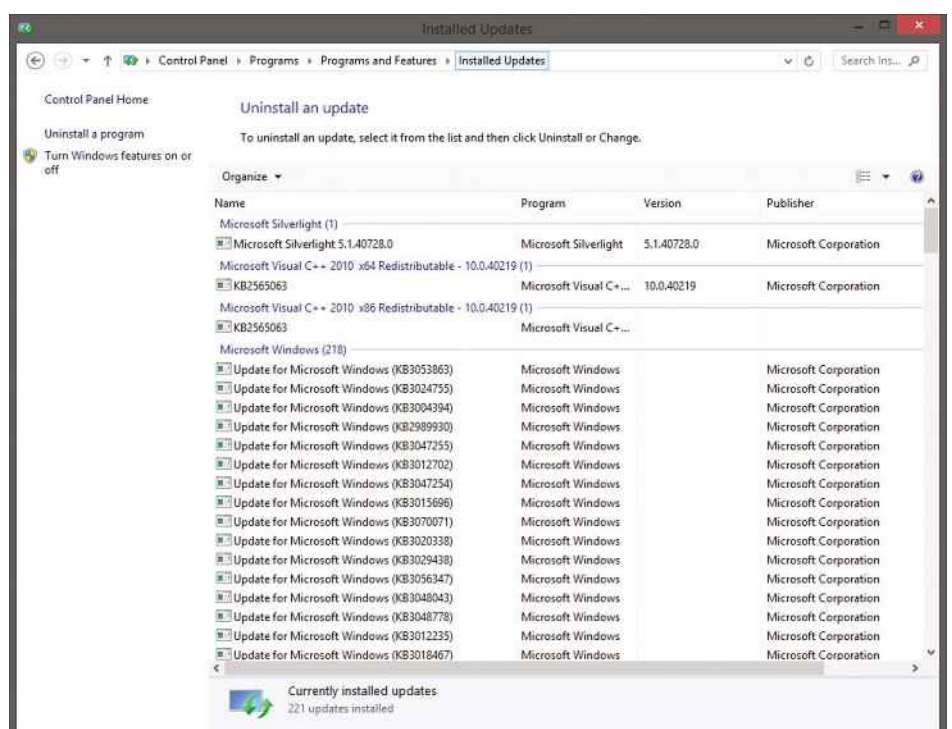
to the actual Windows 10 install rather than an update.

The first step I'd take is to run Windows Update again just to see if there are any other updates you need. Let this run through if needed, and then, back in Control Panel System and Security, click View Update History. Ensure all of your previous updates have been installed properly. If any haven't, use Control Panel\Programs\Uninstall a Program and click View Installed Updates. Now remove any updates that may have

issues if they're listed and update again. This includes KB3035583, the GWX update.

If the issue persists, I'd advise the alternative I've suggested to others; that's to use the downloaded ISO method. The Media Creation Tool supplied by Microsoft ([bit.ly/1KwZCCq](http://bit.ly/1KwZCCq)) will let you do this, and the install here is a local install. It should let you set up Windows 10 with no problems.

▼ Uninstall problem updates and then reinstall to solve some Windows 10 update issues





# ASK JASON



**Meet Jason D'Allison, a veteran of Micro Mart's panel of experts. He's here to help with any technical questions, including anything to do with tablets or smartphones, as well as PCs**

Send your questions to:  
Jason D'Allison  
Micro Mart  
Dennis Publishing  
30 Cleveland Street  
London  
W1T 4JD

Contact Jason by email at:  
jason@micromart.co.uk

While we try to cover as many questions as we can, we regret that Jason cannot answer your questions personally, but he'll cover as many as he possibly can each week. Please ask one question per letter and remember to include the full specification of your computer, including its operating system.

Jason

## Core Blimey!

I was going to replace my Core 2 Quad Q6600 setup (quad-core, 2.4GHz) with one based on a Pentium G3258 (dual-core, 3.2GHz). As you'll know, this is the 'anniversary edition' Pentium, with an unlocked multiplier and monster over-clocking ability (4.5GHz and maybe beyond). However, I've just discovered it doesn't work with Windows 10, not unless one core is disabled or it's put back to stock speed.

Microsoft blames Intel and Intel blames Microsoft. I think it's some sort of Windows update that causes the problem, and it also affects Windows 7. What's the point of the G3258 if one company or the other is blocking its full capabilities? Is the block accidental, or is Intel trying to push users into buying a £200 Core i5? I'll probably now defect to AMD, especially as its CPUs are cheaper. Join the rebellion!

**Anthony Jenkinson, via Facebook**

*Truth be told, I'm not sold on the Pentium G3258. For starters, it's £59 – a 50% markup on the cost of the G3250, which is the same CPU but with a locked multiplier. To reach those monster overlocks, Anthony, you'd need an after-market cooler, too, so that's another £20 (for, say, an Arctic Freezer 7 Pro rev.2). An overlocking-capable motherboard would also be required, one with the Z97 chipset (or the older Z87). About the cheapest, at £61, is ASRock's Z97 Anniversary. That's a tally of £140.*

*A Core i5-4460 costs £143. That's got the same 3.2GHz base frequency, two extra cores, Turbo Boost, double the amount of L3 cache, and superior in-built graphics (if needed). It'd run a treat on the stock cooler, and you could shove it in a motherboard that uses the bargain-bucket H81 chipset. MSI's H81M-P33, as an example, costs just £32. The tally then would be around the £175 mark.*

*Yes, £35 more is £35 more, but the i5-4460 at 3.2GHz beats the G3258 at 4.5GHz in every benchmark. Sometimes it trounces it. Overclocking is fun, but only for half an hour. Once you've got everything stable, the game's over. Until the blue screens start, at any rate, and until you find your programs doing funny things. That's when the real fun and games begin! Except it's not much fun.*

*So, what about this Intel and Microsoft shenanigans? As you say, many Pentium G3258 owners can't get Windows 10 to run or even install unless they remove any overclock or knock a core out. As you suggest, Anthony, the issue first cropped up in Windows 7 and 8.x. The culprit is KB3064209, a CPU microcode update. Here's Microsoft's spiel on it, if you fancy a read: [goo.gl/BQcgJa](http://goo.gl/BQcgJa).*

*With Windows 7 and 8.x, users can circumvent the issue simply by not installing the update. In Windows 10, however, the update is*

*already baked in. There \*is\* a solution, though. It involves renaming a system file (once you're up and running). The full instructions can be found at [goo.gl/Z5UtXt](http://goo.gl/Z5UtXt).*

*From what I can gather on the subject, the crux is that overclocking is only supposed to be possible on Z-series chipsets, but some motherboard makers have found a way to enable it on cheaper chipsets. I think the purpose of KB3064209 is to put the kibosh on that little bit of innovation. You'd think other CPUs would be affected, but there's no real evidence of that. There's evidence, though, that even some Z-series users have come unstuck. It's a shambles, basically, and also morally dubious.*

**“It's a shambles, basically, and also morally dubious”**

*The long and the short of Anthony, is that the Pentium G3258 is more trouble than it's worth. Instead of messing about with it I'd recommend you save yourself a boatload of hassle and buy a Core i5. For performance users, AMD's CPUs aren't on the radar, sadly.*

*Also, bear in mind that LGA 1150, the platform under discussion here, is end-of-line. It's all about LGA 1151 now, with compatible CPUs – the Skylake jobs – already on the shelves. Think hard before opening that wallet for something that will be obsolete before too much time has passed!*

*Note – All prices were taken from [www.ebuyer.com](http://www.ebuyer.com) on 19th August.*

**▼ Is the Pentium G3258 'anniversary edition' really all that worthwhile? Not really**





## Cleaning The Windows

Like many others, I've just pulled the trigger on Windows 10, upgrading from Windows 7. In preparation I backed up all my important data, planning to choose the 'keep nothing' option and have a clean install (or near enough). But no such option appeared, so I've ended up with all my previous apps, settings, and files. This is no good, as I wanted the PC wiped of all the crud it's accumulated over the years. What did I do wrong? I guess I'll have to re-install...

**Nigel, Essex**

*I've scratched my head over this, too. Before Windows 10 went gold, I definitely read that upgraders would get the choice to keep everything or keep nothing. In the setups I've done, however, everything's just been kept – I've had no say in the matter. Of course, if a program or piece of hardware isn't compatible and will be lost or rendered unusable, an alert's (usually) given.*

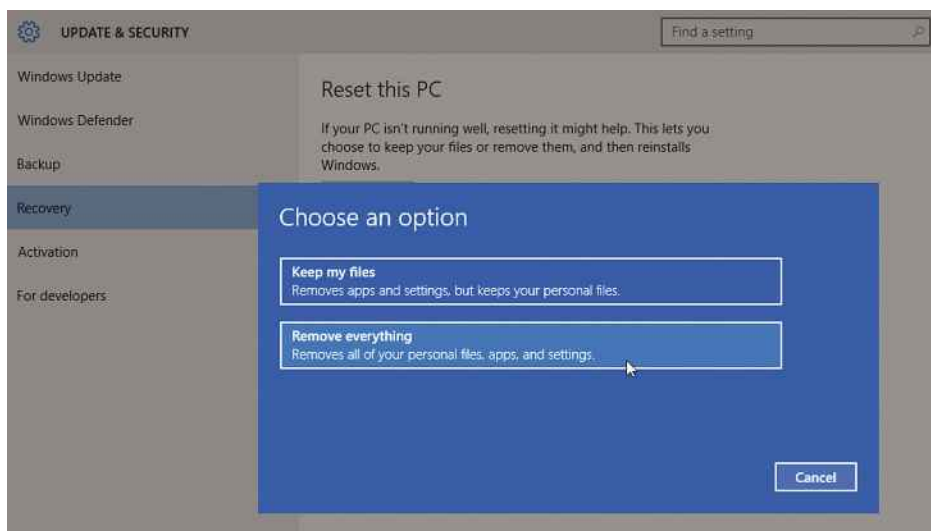
*Maybe the choice was available only in the Windows 10 previews? I confess I didn't try any. Or maybe it's only there when upgrading from Windows 8.1? All my*

*setups have been done from Windows 7. It's a mystery (ask Toyah), especially as some colleagues I've spoken to say they have been given the choice.*

*Anyway, Nigel, it's all moot. Now you've got Windows 10 up and running, click the Start button (hooray for the – nearly – proper Start button) and select Settings. In the new window, select 'Update & security'.*

*In the next new window, select Recovery and then hit the 'Get started' button under 'Reset this PC'. From the pop-up that appears, choose 'Remove everything'. You'll soon have a Windows 10 installation that's as close to clean as makes no difference.*

▼ *I can't understand why options like this weren't introduced in XP or even before*



## Stuck On A Level

About a week ago I updated iOS on my iPhone 4s from 8.4 to 8.4.1. Since then I've had charging problems. When I plug the charger in, the phone's charging symbol often doesn't appear, and if it does it usually vanishes within seconds. Charging isn't completely broken, however, as I've been using the phone since the update and the battery's never gone flat, though the charge level never gets above about 42%. I've tried numerous chargers and cables. What's your diagnosis?

**Jack, Gmail**

*Ah, yes, I've encountered this many times. Don't panic, Jack! There's an outside chance your 4s's charging circuitry is shafted, but I think that's unlikely. More probable is a simple software crash. This isn't uncommon after an update, and the answer is a soft reset (you won't lose any data). Simultaneously hold down the home and power buttons until the phone reboots – it should take five to ten seconds. I've seen this fix no end of iPhone charging problems.*

*If it doesn't fix yours, maybe the dock port's dirty. Give it a good scrubbing with a tooth-brush. Still no joy? Maybe the port's actually damaged, or maybe the battery itself*

*is end-of-life. If you reach this point, don't bother going to Apple, not unless you visit the bank first or give Wonga a bell. Many local shops will do the repairs for a fraction of the cost, as will many eBay sellers (you post your phone in and they post it back).*

*Neither job is hard, however. Take a look at this 4s iFixit guide: [goo.gl/QdkMoX](http://goo.gl/QdkMoX). Even if you're a total beginner, a new battery (£5 on eBay) can be fitted in about*

*fifteen minutes and a new dock port (£2) in about an hour (get the type with the ribbon and microphone attached).*

*Buy both at the same time. Try the battery swap first and move on to the dock port if you don't hit the jackpot the first time around.*

▼ *Almost everything on an iPhone can be fixed cheaply and easily (especially with older models)*





# Crowdfunding Corner

**A new month means it's time to look at the fun side of Kickstarter – video games. This time we're going history-themed, with a pair games set in the distant past**

## **Trial By Viking**

This Viking-themed indie platformer replicates the feel of games like *Rogue Legacy*, *Castlevania* and *Metroid* with its combination of retro-styled thrills and modern visuals. Over 130 hand-crafted levels, 80 unique enemies, 27 boss battles and a huge number of challenges and puzzle elements mean this game is packed up to its horns with things to discover. Along the way you can upgrade your character to emphasise your own playing style, and 28 cutscenes tell the game's story in tandem with in-game dialogue that gives you the ability to alter the story outcome.

Aimed at multiple platforms, *Trial by Viking* is being produced for Windows, Mac OS X, Linux, iOS and Android, with console releases also planned. The game has already been through considerable development, and this campaign is specifically being run to fund software licenses for the engine, the composition of original audio, new artwork and the relevant testing equipment.

The game will be released in February 2016 for desktop platforms (though be warned – almost every Kickstarter game slips a few months, and some slip a lot) with other versions to follow. At time of writing it's still possible to get an early-bird copy for just \$10 (£6.50) but even full price it's only \$13 (£8.50). Higher tiers include early-access to alpha and beta copies, a copy of the soundtrack, and downloadable art book. The goal for the project is \$7,000, and with over \$2,000 raised in the first day, it seems a safe bet that it's going to reach that modest amount.

**URL:** [kck.st/1JfPTyL](http://kck.st/1JfPTyL)

**Funding Ends:** Thursday, September 17th 2015



## **Blackwake**

Blackwake is a multiplayer team game for Windows and Mac OS X centred around Naval Battles, and set during the Age of Sail. Designed to evoke the feeling of being part of a crew, it is played in real-time, in a full 3D environment, and requires strong communication between players who take on any one of several different roles in the crew to help the ship navigate and fight during a match.

Features include various ship sizes, destructible ships, melee and ranged combat for boardings, varied weather and environments, land/sea battles and even the possibility of encountering sea monsters on your adventures. The game is already partially complete and there's plenty of evidence that it's going to deliver on these ambitious promises. Kickstarter backers will get Early Access through Steam, a bonus that is not available any other way.

A copy of the game is priced very reasonably as just AUD\$19 (£9), with higher tiers including multiple copies and exclusive in-game items. Delivery is planned for August 2016, and the goal of AUD 10,000 has long since been smashed, with the project current poised to beat that amount tenfold. That means, with over 2000 backers already, you shouldn't be short of people to play with either.

**URL:** [kck.st/1DSbjBq](http://kck.st/1DSbjBq)

**Funding Ends:** Thursday, September 3rd 2015



**Disclaimer:** Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!



# App Of The Week

## BubbleUPnP

Accessing and streaming media from one device to the next has never been easier

The power of a modern mobile device is truly amazing. Not only can we play some devilishly clever games on them, but they can also play back a wealth of media file types with perfect clarity and in most cases, in glorious high definition. Thanks to the continuing development and improvements to DLNA, which started off life as something of a pain to get going, we can now utilise the impressive abilities of our mobile devices to stream content to and from various sources around our digitally connected homes.

While this combination of ever-more powerful mobile devices and media connecting technology makes for a pretty impressive mixture, with the help of BubbleUPnP we can now have something close to perfect solution for using our phones or tablets to meet all our media needs, wherever we roam.

### BubbleUPnP

BubbleUPnP is an app made up of a couple of distinct elements. For one, it will find shared media from any DLNA certified device, such as a NAS drive, and allow you to play it on the mobile device on which it is installed. Another element is its ability to send media to other network connected players around your home. So essentially, you can select the media from a networked device, and select what other device you want it to end up playing on.

It's a remarkably simple app to use too, all that's needed is to search for the DLNA device on the currently connected network, then browse the shared folders until you find the media you're interested in and finally tap the media in question and BubbleUPnP will start to play it. However, it doesn't transcode video on the fly by default. To bridge this, BubbleUPnP presents the locally installed players capable of handling the video codec

### Features At A Glance

- UPnP/DLNA media servers: most NASs, XBMC, Plex, Twonky, Serviio, Windows Media Player and many more
- Local media stored on your Android device
- Cloud media: Google Drive, Dropbox, OneDrive, Google Music
- Media from other apps such as web browsers and file managers, using Share/Send

and media, and gives you the choice to opt for which one to play the content with.

Also, you can select to download media from a NAS device, or other DLNA device, to the SD Card on your phone, so you can take the media with you when you leave the comfort of your home network.

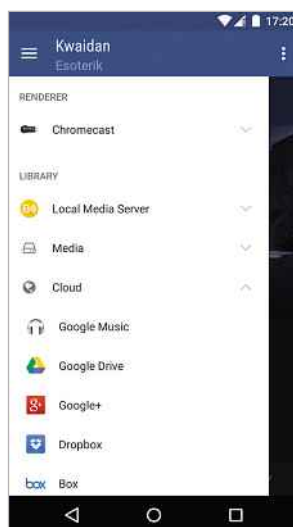
### Conclusion

There are a many streaming and player apps, and BubbleUPnP is just one of them. It's really very good, though: easy to use, fast enough to keep up with the streaming media and offering a server-based version – along with free and paid for versions of the client (the latter removes adverts that appear along the top of the screen).

On the whole it's a good addition to the many apps you probably already have, and if you're seriously considering making all your media accessible around your home, then BubbleUPnP will certainly do an admirable job. We found it far better, in many ways, than ES File Explorer, which we've used in the past. Also, it doesn't have the annoying knack of taking long pauses between music tracks like ES File Explorer does when playing from an online or locally stored network source.



▲ Streaming and accessing your music collection from a NAS is excellent with BubbleUPnP



▲ You can browse the contents of DLNA devices and tap to play



▲ Create Playlists from your Library and media sources



# Logging Off

**A**re you ready for driverless cars? I ask this because they're obviously coming, even if the automotive industry seems hell bent on taking the scenic route to get there. If you remain unconvinced of my assertion, check out the latest car TV adverts, because there is an underlying theme in many of them. There's one where the car parks itself, and another where it brakes automatically, and yet another that alerts you to lane changes.

A few commercials are still banging on about the 'driving experience', and others that just show young people enjoying themselves coincidentally with being in a car. What's becoming clear, though, is that many car makers are pushing the notion that the vehicle itself can start taking care of some functions traditionally allocated to the driver.

This is part of a longer conditioning exercise that will ultimately end in the car that drives itself, once such an idea has become generally accepted. And, the best way for that to happen is for us all to give up small amounts of control, before we give it all up.

This all sounds vaguely familiar somehow, from a computing perspective?

At the moment this process is mostly carrot, with these features being used to attract those who aren't confident of their skills, or who are getting older. Yet in the end the final push will probably be more stick shaped, when insurers make it very expensive for you to drive your own car when it can navigate much more safely without any human intervention. At that point, actual driving will be relegated to the super-rich, ex-*Top Gear* presenters and the like, who can afford to get coverage to be on the roads wholly unassisted. Those who have seen what happens when people drink and drive will probably rejoice, and those who actually enjoyed the open road and their automotive pride and joys will cry into their lime and soda.

As a non-driver, I've got mixed feelings about this; while I like the idea of owning a vehicle that can take me to the pub and back, deep down I know that it will most likely be used to control traffic in a way that makes George Orwell's 1984 world seem like Disney.

At this time it's estimated that 10% of cars either aren't insured, aren't taxed or have no MOT – and a good number aren't roadworthy. This causes huge problems when they're involved in accidents, and given that their drivers aren't big on rules, they have proportionally more of them.

## EDITORIAL

**Editor:** Anthony Enticknap  
[theeditor@micromart.co.uk](mailto:theeditor@micromart.co.uk)

**Designer:** Laura Jane Gunnion

**Designer:** Kevin Kamal

**Bonus John:** John Moore

**Contributors:** Mark Pickavance, Jason D'Allison, Joe Lavery, Sven Harvey, Simon Brew, Dave Edwards, Ryan Lambie, James Hunt, Mark Oakley, Roland Waddilove, tinned mackrel, Hot dog sausages, Sarah Dobbs, David Hayward, Michael Fereday, Ian McGurran, Aaron Birch, David Briddock, Ian Marks, Craig Grannell, Kevin Pocock, Andrew Unsworth, Keir Thomas

**Caricatures:** Cheryl Lillie

## ADVERTISING

**Group Ad Manager:**

Andrea Mason

[andrea\\_mason@dennis.co.uk](mailto:andrea_mason@dennis.co.uk)

## Sales Executive:

Joe Teal

Tel: 0207 907 6689

[joe\\_tea@dennis.co.uk](mailto:joe_tea@dennis.co.uk)

## US Advertising Manager

Matthew Sullivan-Pond

[matthew\\_sullivan@dennis.co.uk](mailto:matthew_sullivan@dennis.co.uk)

## MARKETING

**Marketing Manager:**

Paul Goodhead

Tel: 0207 907 6393

## PRODUCTION

**Production Coordinator:**

John Moore

Tel: 0207 438 2074

[MicroMartAdCopy@gmail.com](mailto:MicroMartAdCopy@gmail.com)

**Digital Production Manager:**

Nicky Baker

## SUBSCRIPTIONS

Save 24% on the cover price:

£77.50 for 51 issues by credit card.

Visit [subscribe.micromart.co.uk](http://subscribe.micromart.co.uk)

Tel: 0845 126 1014

## ONLINE SUBSCRIBER SERVICE

[www.subsinfo.co.uk](http://www.subsinfo.co.uk)

Change your address, renew subscription or report problems: call 0844 844 0082 (UK) or email [micromart@servicehelpline.co.uk](mailto:micromart@servicehelpline.co.uk)

## NEWSTRADE SALES

**Newstrade Director:**

David Barker

## DENNIS PUBLISHING

**Group Publisher:**

Paul Rayner

[paul\\_rayner@dennis.co.uk](mailto:paul_rayner@dennis.co.uk)

## Managing Director:

John Garewal

## Group Managing Director:

Ian Westwood

**COO:** Brett Reynolds

**CEO:** James Tye

**Company Founder:** Felix Dennis

## PUBLISHED BY

**Dennis Publishing**

30 Cleveland Street

London

W1T 4JD

Tel: 0207 907 6000

[www.dennis.co.uk](http://www.dennis.co.uk)

## PRINTING

**Printed By:** BGP

**Distributed By:** Seymour

**Certified Distribution:**

13,712 average copies

Jan-Dec 2010







However, any automatic driving system is going to use a country-wide (or global) system to register all vehicles in real time, probably with how many passengers are inboard and what their intended destination is. I can't think of a single intelligence service that would ignore that all-you-can-eat data buffet, can you? The nirvana of personal transport for the elderly, unskilled and impaired will be presented, and surveillance issues that come with it will be quietly ignored.

How can I be so sure? That's largely what happened with Smartphone technology, the Internet and CCTV.

Driverless cars are coming. Not this year, but some year soon and, unless the code is really badly written, they'll not be driving over people but they may be leaving tread marks on our personal liberties. If we've any of those left by then, anyway.

Mark Pickavance

## LAST WEEK'S CROSSWORD

**Across:** 7 Colloquialism, 8 Alumni, 9 Coeval, 10 Polygon, 12 Atlas, 14 G-Suit, 16 Shelved, 19 Adware, 20 Trumps, 22 Camera Obscura.

**Down:** 1 Roll, 2 Clumsy, 3 Equinox, 4 Pitch, 5 Client, 6 Escalate, 11 Obsidian, 13 The Tube, 15 Imager, 17 Launch, 18 Decay, 21 Port.

### DISCLAIMER

The views expressed by contributors are not necessarily those of the publishers. Every care is taken to ensure that the contents of the magazine are accurate but the publishers cannot accept responsibility for errors. While reasonable care is taken when accepting advertisements, the publishers cannot accept any responsibility for any resulting unsatisfactory transactions. With Anthony braving the Cornish weather on his holibobs, and others spread around performing various tasks, it's a bit like Mary Celeste publishing on *Micro Mart* this week. We're filling the time with as usual, of course: chatting about the fortunes of Birmingham City,

deleting a significant amount of our cloud storage by accident, restoring said content, getting into Twitter arguments, watching videos of Pokemon festivals and discussing *Star Wars*. Oh yeah, and drinking coffee... Lots of coffee. So much coffee, in fact, that we were inspired to write a poem about our favourite beverage. Do you want to read it? Of course you do! Here we go: *Coffee is hot, Milk is cold, Put them together... Liquid gold!* We think you'll agree that it is both factual, and a work of art, not at all unlike this very publication. Indeed, John is currently attempting to put it to music so we can adopt it as our anthem from now on.

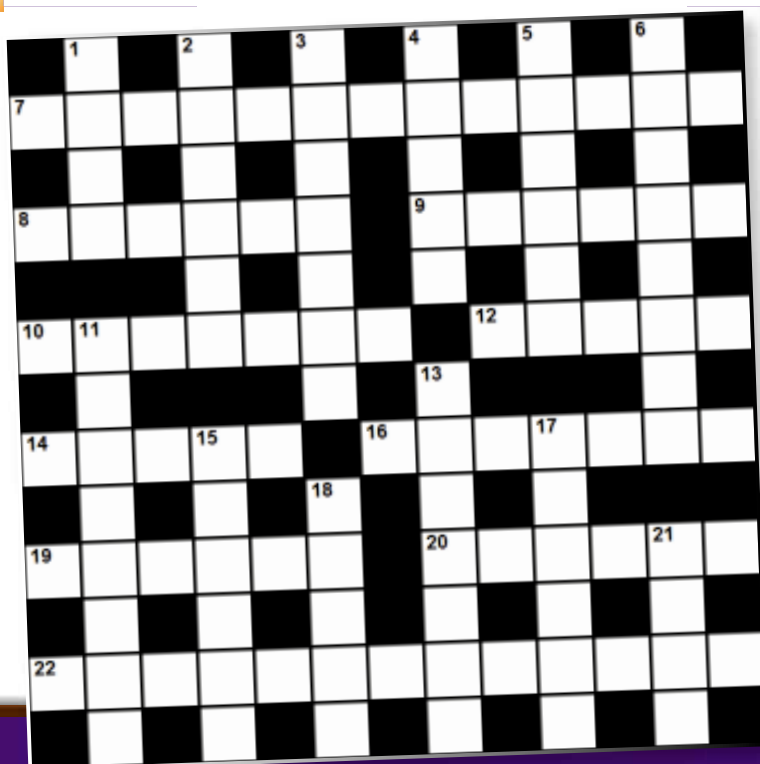
## THIS WEEK'S CROSSWORD

### Across

- 7 A group of bits indicating the status of something inside a computer, often used to decide what instructions the computer will subsequently execute. (9,4)  
8 The second 'D' in DDOS. (6)  
9 An anxiety disorder characterized by extreme and irrational fear of simple things or social situations. (6)  
10 Helps to keep the workings of your PC nice and cool. (4,3)  
12 Speak or perform without previously preparing one's words. (2,3)  
14 A monitoring system in computer hard disks and SSD's that detects and reports on various indicators of drive reliability, (Acronym) (5)  
16 Found in the ordinary course of events. (7)  
19 A state of stability, in which all forces are equal and opposing, therefore they cancel out each other. (6)  
20 Software or hardware that has been superseded but is difficult to replace because of its widespread use. (6)  
22 Of or at a stage before the development of language by the human species. (13)

### Down

- 1 An area or stretch of land having a particular characteristic, purpose, or use. (4)  
2 A formal notice of a financial transaction. (6)  
3 Relating to a star or stars. (7)  
4 Multiple executions of a repeating set of computer instructions. (5)  
5 "Connects you and your Apple devices in amazing ways.." (6)  
6 The arithmetic operation of summing. (8)  
11 A coil in which voltage is induced by motion through a magnetic field. (8)  
13 The positively charged dense centre of an atom. (7)  
15 The final consequence of a sequence of actions or events expressed qualitatively or quantitatively. (6)  
17 A periodical consisting of condensed versions of pieces of writing or news published elsewhere. (6)  
18 A utility module which provides straight-forward, powerful functions for working with asynchronous JavaScript. (5)  
21 A transformer that supplies high voltage to spark plugs in a petrol engine. (4)





# In Next Week's Micro Mart\*

- Home Networking Special  
- with extra pages and  
more features
- Four-page  
Retro Round-up
- Hacking The  
Internet Of  
Things
- Understanding  
Bluetooth
- Plus the usual mix  
of news, reviews and  
advice



\* May be subject to change



# THE POWER TO AMAZE

## SAPPHIRE TRI-X RADEON R9 FURY

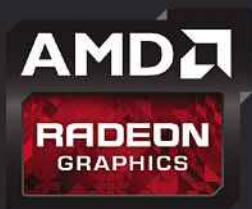
Submit to the unbridled power of the revolutionary SAPHIRE TRI-X™ RADEON R9 FURY. Experience incredible new levels of performance and Realism with High Bandwidth Memory (HBM) and the coolest and quietest TRI-X cooling solution we have EVER developed. The NEW SAPHIRE TRI-X RADEON R9 FURY has the Power to Amaze.

### The Best just got Better

- ▲ Cool and Quiet SAPHIRE TRI-X cooling
- ▲ HBM - 60% more bandwidth than GDDR5
- ▲ 4096-bit High Bandwidth Memory
- ▲ Extreme 4K gaming beyond 1440P
- ▲ Engineered for maximum gaming with Liquid VR, FreeSync and CrossFire support
- ▲ Microsoft DirectX® 12 Ready



**SAPPHIRE TRI-X™**  
RADEON R9 FURY Graphic Card



**SAPPHIRE**  
[www.sapphiretech.com](http://www.sapphiretech.com)

©2014 SAPPHIRE Technology LTD. All rights reserved. AMD, the AMD Arrow logo, Radeon and combinations thereof are trademarks of Advanced Micro Devices, Inc. ©2013 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, AMD OverDrive, Radeon and combinations thereof are trademarks of Advanced Micro Devices, Inc. Microsoft and DirectX are registered trademarks of Microsoft Corporation in the United States and/or other jurisdictions. Other names are for informational purposes only and may be trademarks of their respective owners.



Refurbished Computers are helpful to families, students, businesses and good for the environment!






**lenovo** FOR  
THOSE WHO DO.

£ **179**.90  
inc VAT

**CORE i5 2.40GHZ**

**4GB DDR3**

**160-320GB**

**14.1" WIDESCREEN**



Scan me with your  
smart phone



Scan me with your  
smart phone



- HP 6910p 14.1"
- Dual Core Processor
- WIFI, DVD
- Genuine Windows 7

£ **109**.90  
inc VAT





from £ **239**.90  
inc VAT

**ThinkCentre**

- Quad Core i5-2400 3.1GHz
- 4-16GB Memory
- Solid State Drive as option
- Genuine Windows



Scan me with your  
smart phone



Get  
Windows 10  
For Free

**Gaming ready PCs**



We offer the most  
affordable Gaming  
Desktop Computers

from £ **139**.90  
inc VAT

**Gaming advanced PCs**



- Quad Core Processors
- Huge Memory RAM
- GTX 750 Ti Graphics
- Genuine Windows 7

from £ **219**.90  
inc VAT

**Call 01803 269 861 or**  
**Visit our store**  
**MICRODREAM.CO.UK**  
Go Online for the latest offers!

